Sustainable Mobility and Pedestrian Plan for Pilgrimage Tourism in Vrindavan

Dissertation submitted to
Visvesvaraya National Institute of Technology, Nagpur
in partial fulfillment of the requirements for the award of
the degree

Master of Technology in Urban Planning

By

ESHA SHINDE
(MT23UPL025)

Under the guidance of
Prof. Kishore Joglekar

Department of Architecture and Planning
Visvesvaraya National Institute of Technology
Nagpur 440010 (India)

Year 2024-25

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Declaration

I, **ESHA SHINDE** , hereby declare that this dissertation titled " **SUSTAINABLE MOBILITY AND PEDESTRIAN PLAN FOR PILGRIMAGE TOURISM IN VRINDAVAN** " is carried out by me in the Department of Architecture and Planning of Visvesvaraya National Institute of Technology, Nagpur. The work is original and has not been submitted earlier whole or inpart for the award of any degree/diploma at this or any other Institution / University.

Esha Shinde
Date:

Certificate

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Prof. Kishore Joglekar
Assistant Professor
Dept of Architecture and Planning, VNIT, Nagpur

Head, Department of Architecture and Planning
VNIT, Nagpur
Date:

Department of Architecture and Planning
Visvesvaraya National Institute of Technology,
Nagpur

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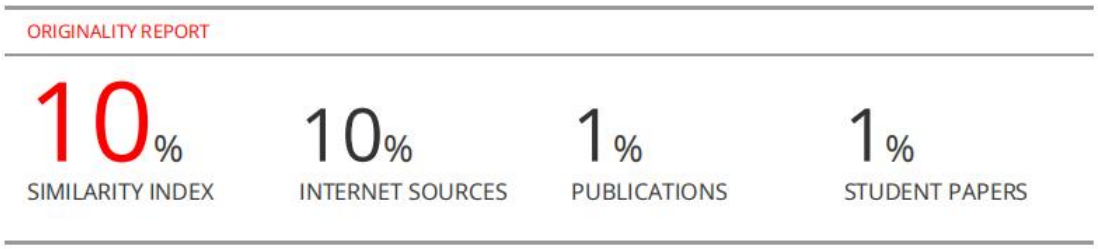

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Prof. Kishore Joglekar
Assistant Professor
Dept of Architecture and Planning, VNIT, Nagpur

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Esha Shinde
MT23UPL025

ABSTRACT

Vrindavan, located in Uttar Pradesh, India, is one of the most revered pilgrimage destinations, attracting millions of devotees annually. However, the city is currently grappling with the adverse impacts of rapid urbanization, unregulated tourism growth, and increasing vehicular traffic. These challenges have led to chronic traffic congestion, environmental pollution, and the erosion of the spiritual ambiance that defines Vrindavan. The clash between heritage preservation and urban development necessitates immediate and sustainable intervention.

This study aims to address these pressing issues by developing a sustainable mobility and green infrastructure framework that harmonizes the needs of pilgrims, residents, and the environment. The research investigates current mobility trends, identifies infrastructural deficiencies, and proposes context-specific interventions to enhance connectivity, reduce pollution, and preserve Vrindavan's cultural essence. Proposed solutions include pedestrian-only temple precincts, electric shuttle services, expanded e-rickshaw networks, smart mobility hubs at key entry points, and dedicated cycle tracks.

Additionally, the study emphasizes the restoration of sacred water bodies such as Yamuna ghats, and the revitalization of green corridors and public spaces to improve ecological health and social interaction. The plan also integrates eco-sensitive zoning, traffic-calming measures, shaded walkways, and accessible last-mile connectivity, particularly for elderly pilgrims.

Primary data was collected through field surveys, GPS mapping, and stakeholder interviews, while secondary data was derived from government programs including AMRUT, HRIDAY, and the Smart City Mission. Geospatial analysis using satellite imagery helped identify land use patterns and mobility bottlenecks.

The outcome of this research is a holistic planning model that merges traditional values with contemporary sustainability practices. It offers actionable strategies for reducing the ecological footprint of tourism, enhancing quality of life for residents, and preserving the sacred identity of the town. This framework can serve as a replicable model for other heritage towns facing similar urbanization pressures.

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1.INTRODUCTION

Tourism plays a vital role in the economic, cultural, and social development of a region. It promotes cultural exchange, generates employment, and supports local businesses. Among various forms of tourism, pilgrimage tourism holds a special place in India due to the country's rich spiritual and religious heritage. Millions of people travel every year to sacred sites to seek blessings, perform rituals, and connect with their faith.

Vrindavan, one of the most revered pilgrimage towns in India, is deeply connected with the life of Lord Krishna. The town is home to numerous temples, ashrams, and religious sites that attract a steady flow of devotees throughout the year, especially during festivals like Janmashtami, Holi, and Radhashtami. Pilgrimage tourism is not just a journey of faith here; it also drives the local economy through hospitality, transport, food, and handicraft sectors.

However, the increasing volume of tourists has brought significant challenges. The absence of planned infrastructure, unmanaged crowd flow, traffic congestion, and environmental degradation are threatening the town’s sustainability and spiritual ambiance. Unregulated tourism without effective planning can lead to the erosion of cultural heritage and degrade the quality of life for both residents and visitors.

To ensure long-term sustainability, it is essential to develop tourism strategies that are eco-friendly, inclusive, and culturally sensitive. Promoting sustainable pilgrimage tourism involves creating better transport systems, encouraging non-motorized mobility, preserving historical sites, and managing tourist flow without compromising the sanctity of the place.

In this context, Vrindavan presents a critical case for implementing sustainable tourism practices. By integrating mobility planning with heritage conservation and environmental management, Vrindavan can become a model for responsible pilgrimage tourism—where tradition and modern urban needs coexist in harmony.

1.1 BACKGROUND

Vrindavan, located on the banks of the Yamuna River in Uttar Pradesh, is a town of profound religious and cultural significance. Associated with the early life of Lord Krishna, it has long been a focal point for pilgrimage tourism, drawing millions of devotees from India and around the world. Historically, Vrindavan evolved as a compact, pedestrian-friendly settlement centered around its temples, ghats, and sacred groves. Movement within the town was primarily on foot or by traditional modes like bullock carts, in harmony with its spiritual atmosphere.

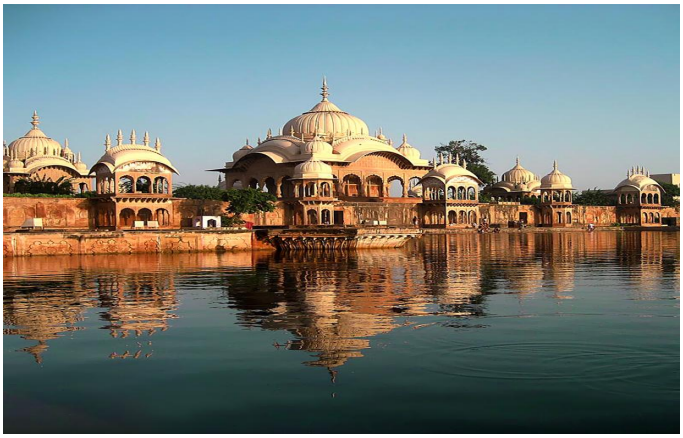


Fig 1 Vrindavan

However, in recent decades, Vrindavan has experienced rapid urbanization and a dramatic rise in tourist footfall. With the growth of modern infrastructure and rising private vehicle ownership, the town's narrow lanes—once suitable for walking and spiritual reflection—are now congested with motorized traffic. Unregulated development, lack of effective urban planning, and insufficient transport facilities have contributed to serious mobility issues, including traffic jams, air pollution, and noise disturbances, particularly during religious festivals and peak seasons.

Moreover, the absence of a coordinated mobility strategy has impacted the safety and comfort of pilgrims, especially the elderly and differently-abled, who often find it difficult to navigate crowded streets. Encroachments on footpaths, inadequate signage, and poor integration of public transport have further reduced walkability and accessibility. As a result, not only is the pilgrim experience being compromised, but the environmental and cultural essence of Vrindavan is also at risk.

Given these challenges, there is a pressing need to restore the town’s walkable character and reduce the dependence on polluting vehicles. A background understanding of these issues underscores the importance of developing a sustainable mobility and pedestrian plan that aligns with Vrindavan’s religious identity, promotes eco-friendly transport, and ensures safe, inclusive access for all visitors and residents.

1.2 NEEDS

Vrindavan is facing growing pressure from increasing pilgrimage tourism, urban expansion, and rising vehicle use. While its spiritual significance remains unchanged, the town's current infrastructure is unable to handle the rising number of daily visitors. During peak festivals like Janmashtami or Holi, the streets become severely congested, posing challenges to both residents and pilgrims. The lack of a planned mobility system, poor last-mile connectivity, and insufficient pedestrian infrastructure are major contributors to this problem.

The need for a **sustainable mobility and pedestrian plan** in Vrindavan arises from the urgent requirement to improve accessibility, reduce environmental pollution, and preserve the

town's spiritual essence. The town's narrow lanes are not designed for heavy motorized traffic, and their continued use by vehicles compromises safety, especially for the elderly, children, and differently-abled pilgrims. Additionally, air and noise pollution from autos, diesel vehicles, and unregulated parking have impacted both public health and the sacred experience of pilgrimage.

There is also a strong need to promote **non-motorized transport** such as walking and cycling, supported by shaded footpaths, signages, resting spaces, and green corridors. Introducing **electric mobility solutions** like e-rickshaws and electric buses will help reduce pollution and ease congestion, especially for last-mile connectivity. Creating **pedestrian-only temple zones** can also enhance the spiritual atmosphere by minimizing noise and vehicular chaos.

Moreover, sustainable mobility is not just about movement—it is about inclusivity, environment, heritage, and urban efficiency. A well-structured plan will make Vrindavan more livable, safer, and more enjoyable for both pilgrims and residents. It will also support the goals of heritage conservation, smart tourism, and climate action.

Thus, the need for a people-focused, eco-friendly, and culturally sensitive mobility strategy is both immediate and essential for Vrindavan's future.

2. SYNOPSIS AND METHEDOLOGY

2.1 AIM

"To promote sustainable mobility and pedestrian-friendly infrastructure in Vrindavan to enhance pilgrimage experience and reduce congestion around heritage zones. "

2.2 OBJCTIVES

- To assess current mobility patterns and identify challenges related to vehicular congestion, pollution, and pedestrian movement near major temples (e.g., Banke Bihari, ISKCON).
- To design green corridors and public spaces that link temples, ghats, and residential areas with shaded walkways and eco-friendly infrastructure.
- To enhance last-mile connectivity through an efficient, user-friendly system enabling easy and uninterrupted travel across modes.
- To propose pedestrian-only zones and low-emission zones around key pilgrimage sites.

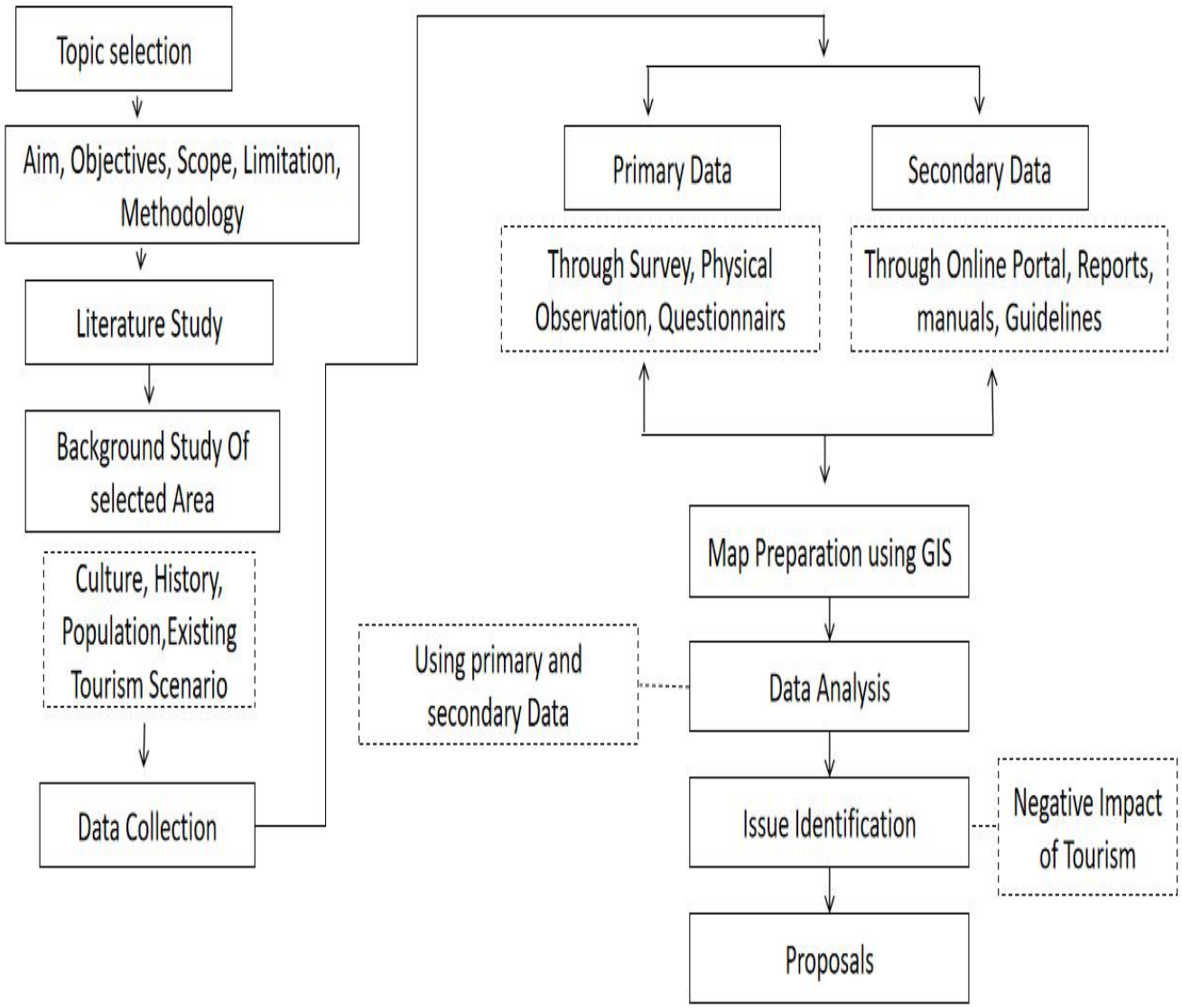
2.3 SCOPE

- The study focuses on Vrindavan, specifically around major pilgrimage destinations such as Banke Bihari Temple, ISKCON, and surrounding ghats.
- It includes analysis of current urban mobility systems, especially pedestrian, e-rickshaw, and public transport networks.
- The research explores green infrastructure such as green corridors, shaded walkways, public parks, and eco-sensitive urban planning.
- It proposes sustainable transport solutions like electric buses, pedestrian-only streets, and last-mile connectivity enhancements.
- The study considers pilgrim and local resident needs, particularly regarding accessibility, environmental comfort, and cultural preservation.
- Data will be sourced from on-ground surveys, satellite imagery, secondary reports, and government schemes like AMRUT, HRIDAY, and Smart City Mission.

2.4 LIMITATION

- Implementation and policy-level challenges are discussed but not modeled in detail due to time and resource constraints.
- Tourist behavior dynamics and seasonal variation impacts are acknowledged but not deeply quantified.
- The study assumes partial availability of local transportation data, which may limit accuracy in traffic and pollution projections.

2.5 METHEDOLOGY



3.LITERATURE REVIEW

3.1 INTRODUCTION

Pedestrian planning is a fundamental aspect of sustainable urban mobility that focuses on creating safe, accessible, and inclusive environments for people who move on foot. In the context of historic and religious cities such as Vrindavan—where the spiritual journey is often experienced through processions, rituals, and walking circuits—pedestrian-friendly infrastructure is not just a functional necessity but a cultural imperative. Traditionally, Vrindavan's narrow lanes and public spaces were designed for foot traffic, supporting the sacred act of walking between temples, ghats, and ashrams. However, with the growing influx of tourists and uncontrolled vehicular intrusion, these spaces have become congested, unsafe, and environmentally degraded.

Pedestrian planning in pilgrimage towns must go beyond basic infrastructure. It requires a holistic and context-sensitive approach that integrates religious movement patterns, environmental sustainability, and user comfort. This includes well-designed walkways, shaded paths, seating areas, signage, drinking water facilities, and universal accessibility for the elderly and differently-abled. Additionally, pedestrian zones must be integrated with last-mile public transport systems such as e-rickshaws and shuttle buses to ensure smooth connectivity while discouraging the use of private vehicles in the heritage core.

The benefits of pedestrian-oriented planning are manifold. It reduces vehicular emissions and noise pollution, improves public health, enhances road safety, and strengthens the overall quality of urban life. In pilgrimage centers like Vrindavan, it also reinforces the spiritual atmosphere by allowing visitors to experience the town at a human scale—slowly, peacefully, and reverently.

Given the sacred character and high-density visitor profile of Vrindavan, pedestrian planning forms a critical strategy in promoting sustainable mobility. It helps restore the sanctity of religious routes and supports the town's transformation into a more livable, walkable, and spiritually enriching urban environment.

3.2 Objectives of pedestrianisation

- **Enhance Walkability:**

To create safe, accessible, and comfortable walking environments that encourage pedestrian movement within urban and heritage areas.

- **Reduce Vehicular Congestion:**

To minimize the reliance on private vehicles, especially in sensitive religious zones, by promoting walking as a primary mode of transport.

- **Improve Safety and Accessibility:**

To provide barrier-free, well-lit, and universally accessible pedestrian routes for all age groups, including the elderly and differently-abled.

- **Preserve Cultural and Spiritual Experience:**
To maintain the sanctity of pilgrimage routes by prioritizing non-motorized, slow-paced movement that aligns with traditional spiritual practices.

- **Promote Eco-Friendly Mobility:**
To integrate pedestrian zones with sustainable transport systems such as e-rickshaws, bicycles, and shuttle services for seamless last-mile connectivity.

- **Encourage Active and Healthy Lifestyles:**
To support physical activity and public health by creating walkable public spaces and reducing pollution-related health issues.

- **Support Tourism and Local Economy:**
To enhance the tourist experience and promote local businesses through vibrant, walkable market streets and cultural corridors.

3.3 Advantages of pedestrianisation

3.3.1 Environmental Impacts
Pedestrian planning significantly contributes to environmental sustainability by reducing the dependency on fossil fuel-based transport. Limiting vehicular movement lowers air pollution, greenhouse gas emissions, and noise levels—common issues in congested pilgrimage centers like Vrindavan. The creation of shaded walkways, green corridors, and permeable surfaces also supports better stormwater management and enhances urban biodiversity. By reducing carbon footprints and integrating nature-based solutions, pedestrian planning restores ecological balance in sensitive spiritual landscapes.

3.3.2 Social Impacts
Walkable environments promote inclusive and equitable access for all, including the elderly, women, children, and the differently-abled. In pilgrimage towns, where spiritual journeys are experienced on foot, pedestrian zones enhance cultural immersion and preserve traditional religious practices. These spaces also encourage social interaction, public gathering, and community bonding. By prioritizing human movement and safety, pedestrian planning contributes to a more livable, people-friendly city that upholds both heritage and dignity.

3.3.3 Economic Impacts
Pedestrian zones often result in increased economic activity by boosting footfall to local shops, vendors, and artisans. With improved accessibility and a pleasant walking environment, tourists tend to stay longer and spend more, directly benefiting the local economy. Moreover, reduced traffic congestion lowers infrastructure maintenance costs and supports efficient land use planning. Investments in pedestrian infrastructure also create job opportunities in construction, tourism services, and heritage management.

3.4 Kind of pedestrianisation

Pedestrianisation refers to the transformation of streets or zones to prioritize pedestrians by restricting or eliminating motor vehicle access. It can be classified into various types based on the level and timing of vehicular restrictions.

Full pedestrianisation completely bans motor vehicles at all times, making the area exclusively accessible to pedestrians. This type is common in religious sites, heritage zones, and busy shopping districts where safety, air quality, and walkability are key concerns.

Partial or time-based pedestrianisation allows vehicular access during off-peak hours, such as early mornings or late evenings, mainly for deliveries or emergency services. During the day, the area is restricted to pedestrians only. This flexible model is ideal for mixed-use urban spaces that need limited vehicle access without compromising pedestrian safety.

Another approach is the **shared space model**, also called a *woonerf*, where pedestrians, cyclists, and low-speed vehicles share the same street space without clear separations like curbs or traffic signals. This design encourages cautious driving and creates a more inclusive and interactive street environment.

3.5 Types of Pedestrian Facilities

Roadway Shoulders.
Roadway shoulders can be adequate for pedestrian usage on roadways that have relatively low traffic volumes. Shoulders may be paved or unpaved (gravel/compacted earth).

Sidewalks.
Sidewalks are located adjacent to roadways, and are usually separated vertically and made of concrete or other hard surfacing. They can be positioned directly next to the roadway (generally with curb and gutter) or may be separated from the street with a planting strip, ditch, or swale. Within Central Business Districts (CBDs), sidewalks should generally be wider to accommodate groups of people and street activity.

Walkways.
Walkways are similar to sidewalks, except that generally walkways are not raised, and construction materials may be soft or hard surface(6). Instead of vertical separation from the street via curb and gutter, walkways are separated from the roadway via planting strips, swales, ditches, extruded curbs, or barriers.

Shared Use Path. This type of facility accommodates pedestrians, bicycles and often times other non-motorized transportation or recreation (e.g. in-line skating).

Fig 2 Roadway Shoulders.

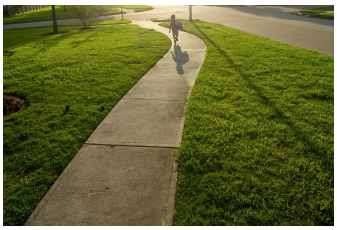


Fig 3 Sidewalks.

Fig 4 Walkways.

3.6 Definition of Pedestrian Facilities

Pedestrian facilities refer to the infrastructure and design elements specifically created to support the safe, convenient, and efficient movement of people on foot within urban and rural environments. These facilities are an essential component of transportation planning, aiming to ensure that pedestrians can navigate cities comfortably while being protected from vehicular traffic and other hazards. With increasing focus on sustainable urban development, pedestrian facilities have become central to promoting walkability, reducing traffic congestion, and improving public health and environmental quality.

The most basic pedestrian facility is the **sidewalk** or **footpath**, which provides a designated space for pedestrians to walk alongside roads. **Crosswalks** or **zebra crossings** are marked on roads to help pedestrians cross safely, often supported by **pedestrian signals** to regulate movement. For high-traffic roads, **foot overbridges (FOBs)** and **underpasses** offer grade-separated options, allowing pedestrians to cross without interfering with vehicle flow. In busy commercial or cultural areas, **pedestrian malls** or **plazas** restrict vehicles entirely, creating safer, more enjoyable public spaces.

Other important features include **refuge islands**, which give pedestrians a safe space while crossing wide roads, **skywalks** that connect buildings or transit hubs, and **tactile paving**, which assists visually impaired individuals in navigating public spaces. **Greenways** and **walking trails** also serve as pedestrian corridors, often integrated into parks or natural areas for recreational use.

The proper design and implementation of pedestrian facilities contribute to safer, more inclusive, and more livable cities. They support reduced dependency on motorized transport, encourage physical activity, and enhance the quality of life for all citizens, particularly children, the elderly, and persons with disabilities. In summary, pedestrian facilities are a vital element of urban infrastructure that supports sustainable, accessible, and people-friendly development.

3.6.1Some important needs of pedestrians

In order to successfully design pedestrian facilities, the pedestrian needs should be recognized. Pedestrian needs are diverse. Some typical pedestrian needs are:

- Safe streets and walking areas
- Conveniences
- Nearby places to walk

- Visibility
- Comfort and shelter
- Attractive and clean environment
- Access to transit
- Interesting things to look at while walking
- Social interaction

3.7 Pedestrian characteristics

This topic tells about different users which are characterised into age groups, older Pedestrian and people with disabilities.

Age group

Different pedestrian age groups have different needs. Common pedestrian characteristics related to age groups are:

Age 0 to 4	• Learning to walk • Requiring constant parental supervision • Developing peripheral vision, depth perception
Age 5 to 12	• Increasing independence, but still requiring supervision • Poor depth perception • Susceptible to "dart out"/ intersection dash
Age 13 to 18	• Sense of invulnerability • Intersection dash
Age 19 to 40	• Active, fully aware of traffic environment
Age 40 to 65	• Slowing of reflexes
Age 65+	• Street crossing difficulty • Poor vision • Difficulty hearing vehicles approaching from behind • High fatality rate

Older adults have a variety of needs as pedestrians. Research shows that people over 60 walk more, yet in some cases may have impaired mobility.

Aids to older pedestrians

- Reduced roadway crossing distances (bulb-outs and curb extensions)
- Signals within 60 feet of viewing distance; easy-to-read signs
- Refuge areas in roadway crossings
- Traffic calming
- Shelter and shade

- Handrails
- Smooth surfaces and unobstructed travel ways
- Signal timing at lower than average walking speed

People with disabilities

People with disabilities, including those using special walking aids or wheelchairs, need carefully designed facilities that eliminate barriers. The needs of pedestrians with disabilities can vary widely depending on the type of disability and level of impairment.

Aids to pedestrians with Disabilities
- Curb cuts and ramps
- Tactile warnings
- Easy-to-reach activation buttons
- Audible warnings and message systems
- Raised and Braille letters for communication
- Signal timing at lower than average walking speed
- Maximum grade of 1:20 and cross slope of 1:50 (ramps can be 1:12)
- Roadway crossing refuges
- Reduced roadway crossing distances (bulb-outs and curb extensions)
- Traffic calming
- Handrails
- Smooth surfaces and unobstructed travel ways

Levels of use and Travel characteristics

Pedestrian travel is higher in urban areas, but pedestrians can also be found in suburban and rural areas. It is also important to recognize that people living in suburban and rural areas travel as pedestrians for different purposes than those living in urban areas. Urban areas receive high pedestrian use because
.
- Higher densities of residences, businesses, and other origins and destinations
- Traffic congestion
- Shopping and services are more accessible to pedestrians
- Average trip distances are shorter
- Parking is too costly or unavailable
- Transit service is more readily available
- More available pedestrian facilities

Typical Types of Pedestrian Trips more and more people are choosing to make as pedestrians are to and from work and school then some social visits and events, appointments, for health and exercise people choose to walk, for errands and deliveries, for recreational

purposes, for other extracurricular activities and both recreational and walking while shopping.

Some of the Common Reasons for Low Levels of Pedestrian Travel include:

- Poor facilities; lack of sidewalks or walkways
- Failure to provide a contiguous system of pedestrian facilities
- Concerns for personal safety
- Failure to provide facilities to and from popular origins and destinations
- Inclement weather
- Poor lighting

4.CASE STUDY

4.1 Lucknow

Cities should be for people, not vehicles: Urban development in India has largely prioritized motor vehicles, often at the cost of pedestrian safety and convenience. The study calls for reversing this trend and making cities more walkable.

Importance of walkability: Walkability has health, environmental, and economic benefits. It reduces carbon emissions, supports public health, increases land value, and enhances social interaction.

Lucknow's current challenges:

- Poor pedestrian infrastructure despite heavy pedestrian movement.
- Encroached, broken, or missing sidewalks.
- Unsafe crossings and lack of foot overbridges/subways.
- Increased vehicle growth, leading to marginalization of pedestrians.

MRTS and pedestrian surge: With the introduction of MRTS, pedestrian traffic around transit nodes will increase significantly. This demands urgent redesign and improvement of pedestrian facilities.

- **Walkability index**: The study proposes a detailed framework to assess walkability, covering safety, convenience, accessibility, amenities, environmental quality, and policy support.

- **Design and policy recommendations**:

- Provide barrier-free, safe sidewalks and crossings.
- Integrate urban aesthetics and cultural heritage.
- Adopt policy reforms and legal protections for pedestrians.
- Promote car-free zones, Woonerfs, and Transit-Oriented Development (TOD).
- Involve public and private sectors in planning.

Map Analysis

EVALUATING WALKABILITY

Table 1 Components, Indicators and Variables for evaluating 'Walkability'

Component		Indicator		Variable
Safety & Security	1	Pedestrian Fatalities and Injuries	1	Proportion of road accidents that resulted in pedestrian fatalities
			2	Proportion of road accidents that resulted in pedestrian injuries
	2	Modal Conflict	3	5-minute interval count of pedestrians walking in street among other modes
			4	Pedestrians who do not feel safe from road accidents
	3	Crossing Safety	5	Crossing safety (1-5 LOS)
			6	*Buffer to moving vehicles with walkway
	4	Crossing Exposure	7	Average time waiting to cross
			8	Judgement: sufficient time given (for healthy adult, small children, elderly & disabled) to cross
	5	Traffic Management at Crossings	9	Type (e.g., pedestrian - phase signal) as function of number of lanes and avg. traffic speed
	6	Security	10	Perception of security from crime (1-5 LOS)
			11	Proportion of walkable roads with street lights
	7	Safety Rules and Laws	12	Existence of relevant pedestrian safety laws and regulations
			13	Enforcement of relevant pedestrian safety laws and regulations
	8	Pedestrian Safety Education	14	Presence of pedestrian safety education programme
	9	Motorist Behaviour	15	Yielding to pedestrians Convenience and attractiveness
	10	Cleanliness	16	Cleanliness of walking paths (1-5 LOS)
	11	Quality and Maintenance of Walking Path Surface	17	Pedestrians inconvenienced by poor walking path surface material (1-5 LOS)
			18	Proportion of roads without sidewalks
	12	Disability Infrastructure	19	Existence and quality of facilities for blind and disabled persons (1-5 LOS)
	13	Obstructions	20	Permanent and temporary obstacles on walking paths (1-5 LOS)
			21	*Level of (Permanent and temporary) Encroachment for private interest. i.e. Proportion of encroachment free pedestrian walkways.
	14	Walking Path Congestion	22	Pedestrian congestion (1-5 LOS)
			23	*Diversity of people
	15	Pedestrian Amenities	24	Amenities (e.g., benches, public toilets) (1-5 LOS)
			25	Pedestrian way finding signage (1-5 LOS)
	16	Trees	26	Average number of trees per km of road
	17	*Climatic Concerns	27	Proportion of walking paths with climate considerations (e.g., covered by arcades & *flow of breeze)
	18	*Environment Quality	28	*Air & Odour Quality
			29	*Acceptable Noise level for area
	19	Connectivity	30	Connectivity between residential and employmentcentres (adjacent Landuse) (1-5 LOS)
			31	*Building Accessibility from walkway
			32	*Presence of Public Transportation System
	20	*Parking Provision	33	*Availability of Parking Space
	21	*Scope of Expansion / improvement of Infrastructure	34	*Land Availability for infrastructure development
			35	*Available Right of way (ROW) for increasing pedestrian facilities and amenities.
Policy support	22	Planning for Pedestrians	36	Incorporation of pedestrian plans in transportation plan details
			37	Relative importance of pedestrians in city planning(agency self-rating)
			38	Degree of centralization among bodies responsible for different aspects of pedestrians planning
	23	Relevant Design Guidelines	39	Presence of relevant urban design guidelines
			40	Presence of relevant building design guidelines
			41	*Presence of billboard advertising rules
	24	Heritage Conservation Rule	42	*To support socio-cultural heritage of city
			43	*Implementation of ASI regulations to special area

Source: Global Walkability Index: Summary of Components, Indicators, and Variables (2005) '*' filtration/ addition of variables in context to study of Lucknow City (to above source).

Fig 5 Number of Pedestrian Intensity Around Proposed MRTS Interchange Hazratganj, Lucknow

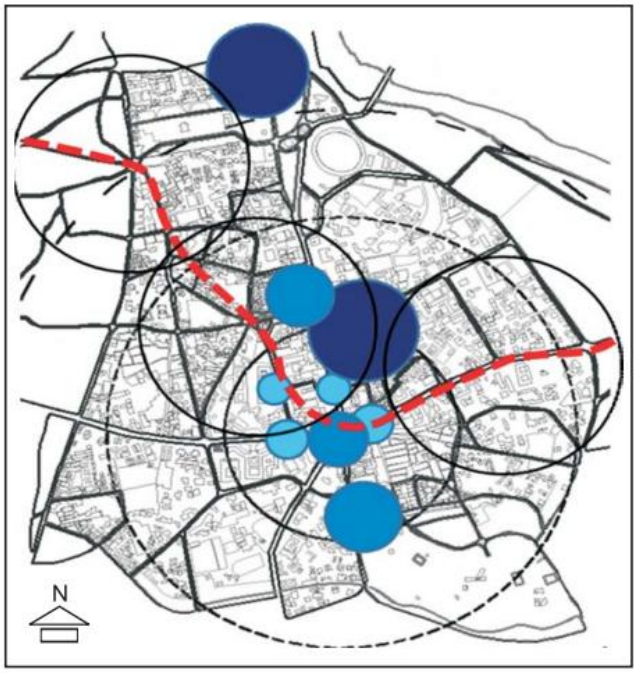
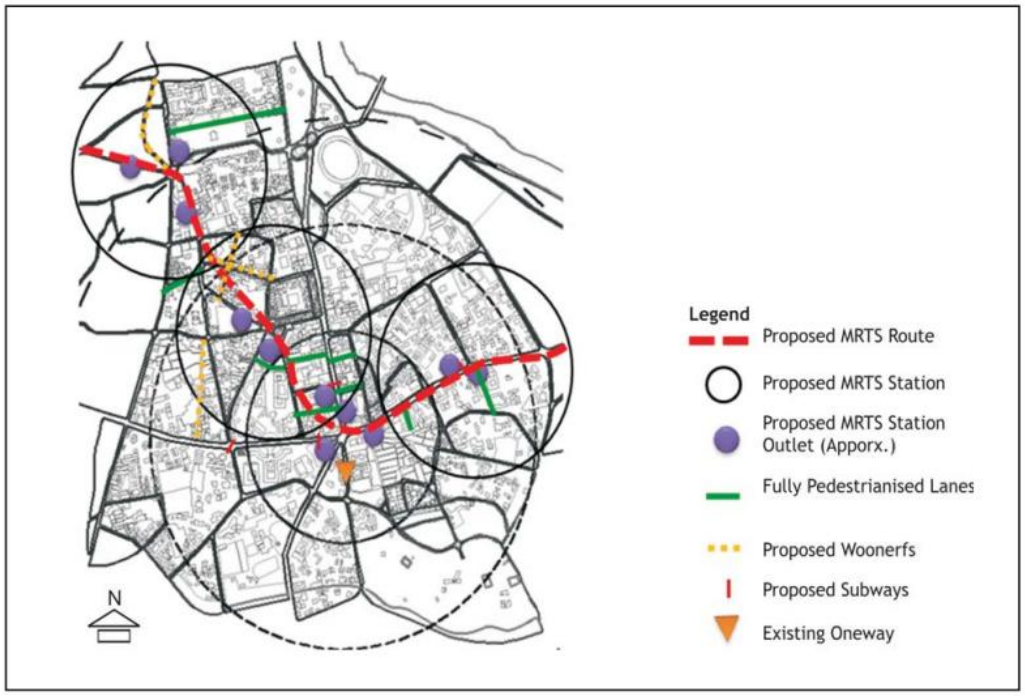


Fig 6 Few Identified Features to Enhance Walkability Conditions with Upcoming MRTS Proposal



Most of the activities in highly pedestrianized areas are governed by public sector. Hence public sector can share a responsibility towards pedestrian movement also. Most of the public and semi-public sector can play a major role by providing setbacks for creating 'fully pedestrianized lanes'. This will also resolve the issue of increased walking distance due to gated communities and institutions. Requirement of such fully pedestrian lane is at Hazratganj, Ashok Marg, Lekhraj, Charbagh, Kanpur road (between Charbagh to Alambagh) and Moti Jheel mill area.

4.2 Amristar, Punjab

Background & Purpose

Amritsar, known for the **Golden Temple** and **Jallianwala Bagh**, was facing **traffic congestion, air and noise pollution**, and **unorganized street activity** on the main approach road.

In 2015, the Punjab government **pedestrianized** the commercial street from the multilevel parking to the Golden Temple to:

- Improve the **tourist experience**
- Enhance **public safety**
- Preserve the **heritage character** of the area

Environmental Impact

- Drastic **reduction in pollution** (air, noise, traffic congestion).
- Improved **walkability** and **public health**.
- Positive aesthetic changes like **landscaping, seating, and LED screens** attracted more tourists.

Economic Impact

- **Shops on the pedestrianized street** benefited due to increased foot traffic and a heritage-themed redesign.
- **Shops on surrounding streets** suffered economically due to reduced vehicle access and customer flow.
- A **new shopping plaza** was built to organize and relocate old markets.

Social & Health Impact

- Survey shows **95% of the public felt a positive social impact**, enjoying a cleaner, safer space.
- The space became a **community hub**—a place for families, elderly, and tourists to relax.

Data Insights

- 580 people surveyed:
- 300 tourists
- 230 local residents
- 50 shopkeepers

- **90% of shopkeepers** on the pedestrian path reported **positive economic outcomes**.
- **97% of tourists** felt that the area's **aesthetic and functionality** improved.

- **Age demographics** show wide use across all age groups.

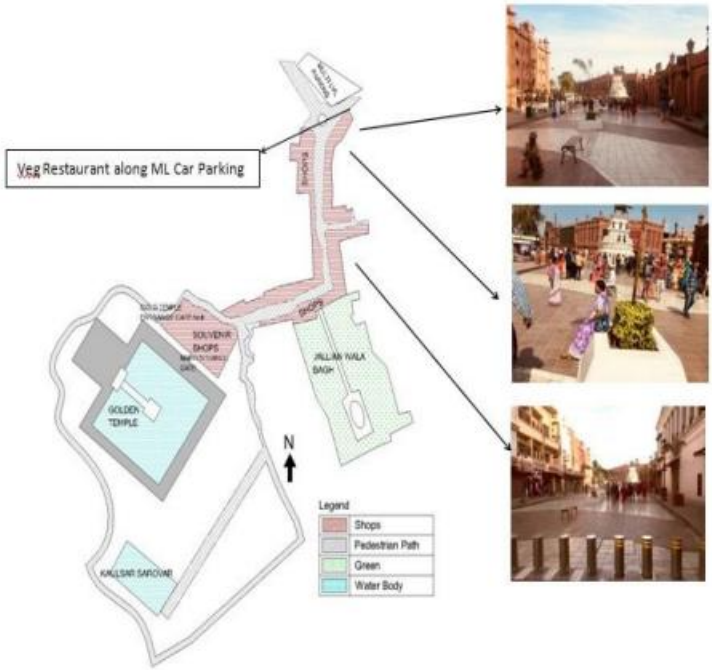


Fig 7 Pedestrian path from Multilevel Parking up to Golden Temple.
Source: Drawing is prepared by author.

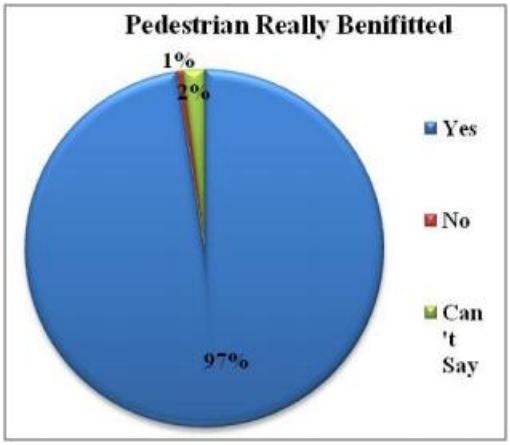


Fig 8 Analysis of Benefits of Pedestrianized path

4.3 Existing norms and policies

4.3.1 Policies

1. National Urban Transport Policy (NUTP) 2006

- Integrated land use and transport policy
- Equitable distribution of road space between all road users
- Priority to the use of public transport
- Priority to non-motorized modes (9).

2. Central Motor Vehicles rules (CMVR) 1989 Safety Rules states that motorists cannot enter pedestrian way and are liable to penalty.

The Central Motor Vehicles Rules, 1989... Driving test..... show courtesy and consideration for the safety and convenience of other road users, such as pedestrians, drivers of other motor vehicles or cyclists (10).

3. Rules of the Road Regulations, 1989

Right of way-The pedestrians have the right of way at uncontrolled pedestrian crossings. When any road is provided with footpath or cycle track specially for other traffic, except with permission of a police officer in uniform, a driver shall not drive on such footpath or track (11).

4. Indian Penal Code (sec 283), sec 34 of Delhi Police Act -- Obstruction in public space punishable. Danger or obstruction in public way or line of navigation: Whoever, by doing any act, or by omitting to take order with any property in his possession or under his charge, causes danger, obstruction or injury to any person in any public way or public line of navigation, shall be punished with fine which may extend to two hundred rupees.

5. The National Policy on Urban Street Vendors, 2009, approved by the Central government, recognizes street vendors (or micro-entrepreneurs) as "an integral and legitimate part of the urban retail trade and distribution system." The national policy gives street vendors a legal status and aims at providing legitimate vending/hawking zones in city/town master or development plans (12).

6. Police Act provides for penalty for jaywalking.

7. Persons with Disabilities Act 1995 (Sec 44) recommends guidelines for the disabled persons (13).

5.CITY PROFILE - VRINDAVAN

5.1 INTRODUCTION TO THE CITY

Vrindavan, located in the Mathura district of Uttar Pradesh, India, is a town of immense religious, cultural, and historical significance. Situated along the banks of the Yamuna River, Vrindavan is revered as the place where Lord Krishna is believed to have spent his childhood and performed numerous divine pastimes (leelas). As one of the most sacred sites in the Braj region, it attracts millions of pilgrims and spiritual seekers from across India and the world.

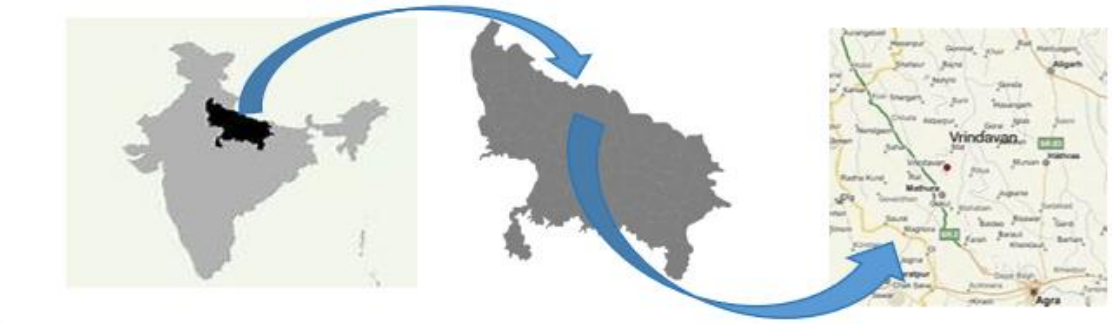


Fig 9 Map

The name "Vrindavan" originates from “Vrinda” (a form of the sacred Tulsi plant) and “van” (forest), referring to the lush groves that once filled the area. The town is dotted with hundreds of temples, ghats, kunds (sacred ponds), and ashrams, with the most prominent being the Banke Bihari Temple, ISKCON Temple, Radha Raman Temple, and Nidhivan. These sites form the spiritual and cultural fabric of the city and are central to its identity.

Historically, Vrindavan was a small forested settlement that gained prominence in the 16th century when the saints Chaitanya Mahaprabhu and Swami Haridas rediscovered many of the lost sites connected to Krishna. Since then, Vrindavan has evolved into a major pilgrimage destination, growing in scale and significance over the centuries.

In recent years, the town has witnessed rapid urbanization and a sharp increase in tourist footfall, especially during festivals like Holi, Janmashtami, and Kartik Purnima. While this growth has contributed to economic development and improved connectivity, it has also created new challenges. Unregulated construction, traffic congestion, pollution, and pressure on natural resources have begun to impact the town's spiritual ambiance and environmental balance.

Despite these issues, Vrindavan continues to be a powerful spiritual center that blends tradition with changing urban realities. Its unique character lies in the co-existence of religious rituals, sacred geography, and a rich devotional culture. To preserve its sanctity while accommodating modern needs, Vrindavan requires sensitive and sustainable urban planning—particularly in areas like mobility, waste management, green infrastructure, and heritage conservation.

In this context, Vrindavan stands as both a holy town in need of protection and a model for developing sustainable pilgrimage cities that respect their historical and spiritual legacy.

5.2 HISTORY

Vrindavan, a sacred town located in the Braj region of Uttar Pradesh, holds a central place in the spiritual landscape of India. It is closely associated with the life and divine pastimes of **Lord Krishna**, who is believed to have spent his early years here. The town's name is derived from two Sanskrit words—**"Vrinda"**, referring to the sacred Tulsi plant, and **"Van"**, meaning forest—thus "Vrindavan" means the "forest of Tulsi."

Mythological and Ancient Period

According to **Hindu scriptures**, especially the **Bhagavata Purana**, Vrindavan was the site of Krishna's childhood leelas (divine plays), including the Raas Leela with Radha and the Gopis, the taming of Kaliya Naag, and the lifting of Govardhan Hill. During this time, Vrindavan was believed to be a lush forested area with 12 sacred groves, forming the heart of the **Braj Bhoomi**.

While there is limited archaeological evidence from this ancient period, Vrindavan is frequently mentioned in religious texts and oral traditions. Its mythological significance made it a revered site, though it was largely uninhabited and covered in dense forests for centuries.

Medieval Rediscovery and Development

Vrindavan regained prominence in the **16th century**, during the **Bhakti movement**, when several saints and poets, particularly **Chaitanya Mahaprabhu**, visited the area and rediscovered the lost sites of Krishna's pastimes. Inspired by divine visions, he instructed his followers, especially the Six Goswamis of Vrindavan—**Rupa Goswami, Sanatana Goswami, and others**—to identify and restore sacred places and build temples.

During the reign of the **Mughal emperor Akbar**, Vrindavan enjoyed a period of relative religious freedom. Some of its most famous temples, such as the **Madan Mohan Temple**, **Govind Dev Temple**, and **Radha Raman Temple**, were constructed during this time with support from both Hindu patrons and, at times, Mughal tolerance.

Colonial Period

Under **British colonial rule**, Vrindavan maintained its religious significance, although temple construction slowed. The area remained mostly under princely and local governance, with Mathura emerging as the administrative center. Devotees continued to visit the town, and pilgrimage routes remained active.

Modern Period and Urban Expansion

Post-independence, Vrindavan experienced major changes. The construction of roads, railways, and improved transport increased connectivity, making it easier for pilgrims to visit.The establishment of **ISKCON (International Society for Krishna Consciousness)** in

The 1970s added an international dimension to Vrindavan's spiritual landscape.

In recent decades, however, rapid urbanization, tourism pressure, and unregulated development have posed threats to Vrindavan's natural, cultural, and spiritual heritage. The town's population has grown, and its once-quiet lanes are now bustling with vehicles, shops, and dense constructions, often at odds with the sacredness of the place.

Despite these challenges, Vrindavan remains a vibrant center of **Gaudiya Vaishnavism**, devotional arts, and pilgrimage tourism. Efforts are now being made by government bodies, spiritual organizations, and urban planners to preserve its sanctity through heritage conservation, green infrastructure, and sustainable tourism initiatives.

~3000 BCE (Mythical)	Pre-6th Century CE	1515 CE	1550s–1600s	1590 CE	1658–1707 CE	18th–19th Century	1970s	1990s–2000s	2014–Present
Krishna's divine pastimes (leelas) in Vrindavan – Rasa Lila, Kaliya Daman, etc.	Early folk worship traditions and natural forest (van) culture	Chaitanya Mahaprabhu visits Vrindavan; revives Krishna bhakti; identifies sacred sites	Goswamis of Vrindavan construct key temples: Madan Mohan, Radha Vallabh, etc.	Govind Dev Temple built by Raja Man Singh of Amber	Aurangzeb orders destruction of temples; some idols moved to Jaipur and Nathdwara	Continued temple patronage by kings; ghats built; rise of organized Braj pilgrimage	ISKCON establishes Krishna-Balaram Mandir; global devotees begin visiting	Rapid urban growth, unplanned development, rise in pollution and congestion	Heritage and urban renewal under HRIDAY, PRASHAD, Namami Gange, and Smart City schemes

Fig 10 History of Vrindavan

5.3 Climate

Vrindavan, located in the **Mathura district of Uttar Pradesh**, experiences a **semi-arid climate** with **distinct seasonal variations**. The climate is influenced by its inland location and proximity to the Yamuna River. Like much of northern India, Vrindavan's weather is marked by **extremely hot summers**, **cool winters**, and a **short monsoon season**.

Season	Months	Temperature Range	Characteristics	Challenges
Summer	March – June	30°C – 45°C	Very hot, dry, harsh sun, hot winds (loo)	Heatstroke risk, low outdoor comfort
Monsoon	July – September	25°C – 35°C	Moderate rainfall, increased humidity	Waterlogging, mosquito breeding
Winter	October – February	7°C – 22°C	Cool, dry, pleasant weather, occasional fog	Fog delays, cold wave in Jan

Parameter	Value / Range
Climate Type	Semi-arid
Average Rainfall	600 – 800 mm/year
Hottest Month	May (up to 45°C)
Coldest Month	January (as low as 5°C)
Best Tourist Season	October to March
Humidity Level	Low (Summer), High (Monsoon)

5.3.1 Impact of Climate Change

Rising Temperatures: More frequent heatwaves are being observed, making summers harsher and longer.

Erratic Rainfall: Unpredictable and intense rainfall events can lead to flash floods and strain on drainage infrastructure.

Water Scarcity: Higher temperatures and irregular rainfall are impacting groundwater recharge and the Yamuna River's flow.

Air Quality Decline: Dust storms in pre-monsoon months and winter smog are worsening due to urbanization and climate shifts.

Tourism Vulnerability: Extreme weather conditions could affect pilgrimage patterns and seasonal tourism revenue.

5.4 Administrative Boundary

Vrindavan is part of the **Mathura District** in the state of **Uttar Pradesh**, India. The town is governed under a structured **urban local body (ULB)** and lies within defined jurisdictional boundaries for administrative, planning, and service delivery purposes.

Feature	Description
State	Uttar Pradesh
District	Mathura
Sub-District/Tehsil	Chhata Tehsil (Vrindavan lies within this tehsil)
Urban Governance Body	Vrindavan Nagar Palika Parishad (now merged into Mathura-Vrindavan Municipal Corporation)
Municipal Body (since 2017)	Mathura-Vrindavan Municipal Corporation (MVMC)
Total Wards in Vrindavan	Approx. 25–30 wards (based on current MVMC structure; subject to delimitation)
Parliamentary Constituency	Mathura (Lok Sabha seat)
Assembly Constituency	Govardhan (Vidhan Sabha seat)
Police Jurisdiction	Under Vrindavan Police Station, Mathura District Police

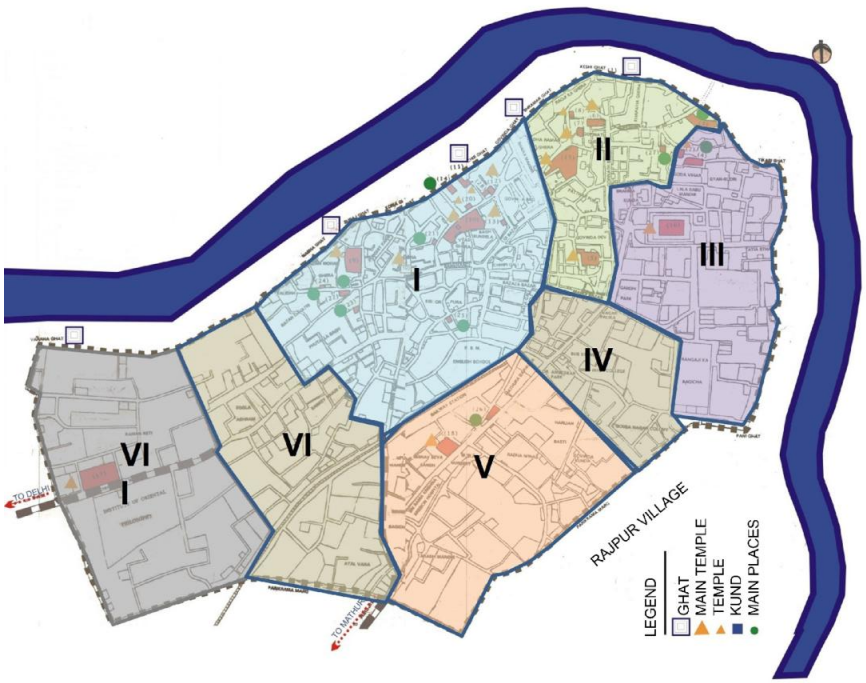


Fig 11 Ward Boundary

5.5 Demography

Vrindavan, a prominent pilgrimage town in the Mathura district of Uttar Pradesh, has a population of approximately **90,000** as of 2025, showing a steady rise from the 2011 Census figure of 63,005. The town has a slightly skewed gender ratio with about **900 females per 1,000 males**, reflecting gradual improvement over the past decade. Children under the age of 6 constitute nearly **10–12%** of the population. The **literacy rate** stands at around **78–80%**, with male literacy higher (around 85%) compared to female literacy (approximately 71%). The town's population is predominantly **Hindu (95%)**, with small Muslim (3%) and other religious communities (2%) including Jains and Christians. A unique social aspect of Vrindavan is its large community of widows—estimated at around **3,000 to 5,000 women**, many of whom have migrated from other states and live in ashrams or government-run shelters. The **floating population** during peak pilgrimage seasons and festivals such as Janmashtami, Holi, and Kartik Purnima often exceeds **5 to 10 lakh**, far outnumbering the resident population and placing significant pressure on local infrastructure. This demographic profile highlights Vrindavan's dual character as a small urban town and a major religious tourism hub, demanding well-planned services, sustainable infrastructure, and inclusive social development.

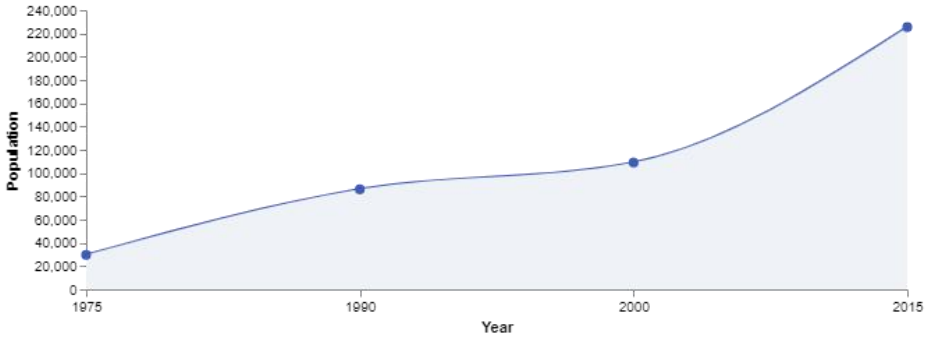


Fig 12 Population Graph

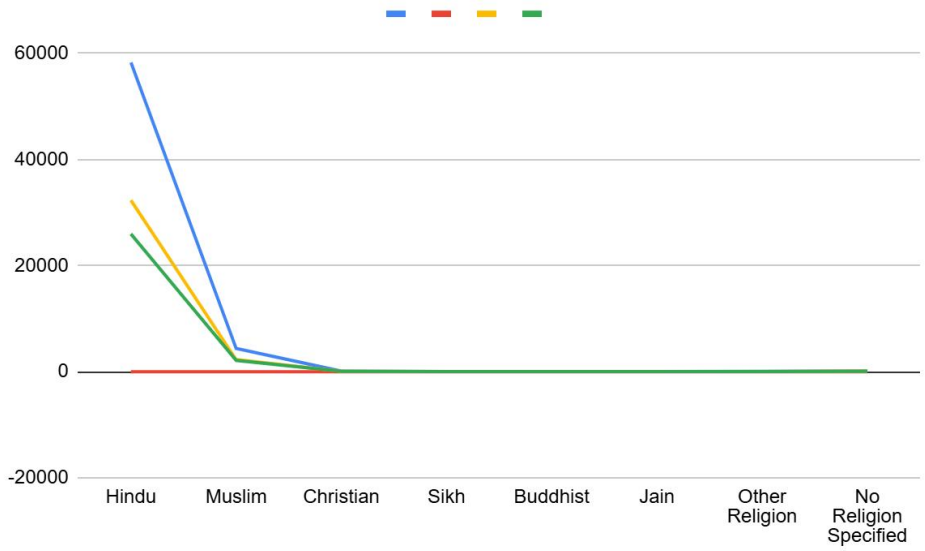


Fig 13 Religious

Demographic Indicator	Vrindavan (NPP)	Uttar Pradesh (State Average)
Total Population (2011)	63,005	-
Child Population (0-6 years)	7,818 (12.41% of total)	-
Female Sex Ratio	812	912
Child Sex Ratio (0-6 years)	884	902
Overall Literacy Rate	77.77%	67.68%
Male Literacy Rate	83.74%	-
Female Literacy Rate	70.32%	-

- **Steady Growth**: Between 2001 and 2011, Vrindavan experienced a moderate population increase of approximately 10.5%.

- **Accelerated Expansion**: From 2011 to 2025, the population is projected to grow by about 42.8%, indicating a significant acceleration in urban development and migration.

- **Urbanization Factors**: The surge in population can be attributed to factors such as increased religious tourism, infrastructural developments, and the city's integration into broader urban planning initiatives.

This chart presents estimated footfall or activity levels at 26 surveyed locations across Vrindavan, as part of the assessment for last-mile connectivity and urban infrastructure needs.

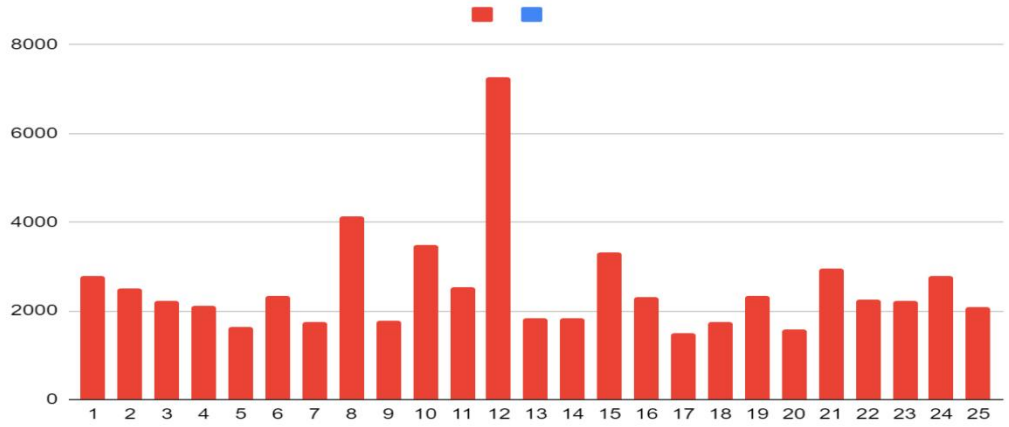


Fig 14 Ward Graph

Key Observations

- Location 12 shows a significantly higher footfall (~9300), marked in blue, indicating it is a major hotspot—likely a key temple or convergence area.
- The remaining locations have moderate and relatively stable footfall (between 1700–4100).
- Such footfall disparities suggest uneven visitor distribution and potential congestion

- pressure at key sites.

- Ward 12 may have older, established neighborhoods or unauthorized colonies with high occupancy.
- Higher floor-to-area ratio (FAR) allows more people to live in smaller plots.

5.6 GROWTH PATTERN

The Mathura district, which includes the sacred town of Vrindavan, has undergone significant land use transformation due to rapid urbanization and tourism-led development. The built-up area of the district has increased dramatically from **7.12% in 1973 to 23.9% in 2018**, reflecting an intense expansion of urban and semi-urban settlements. This change has been particularly sharp in religious and pilgrimage towns such as **Vrindavan**, where infrastructural growth has outpaced the district average.

Much of this urban expansion is concentrated in and around the **core temple zones**, and especially along the **Yamuna River**. These areas have witnessed **dense construction activity**—temples, guest houses, hotels, residential complexes, and commercial facilities—to cater to the growing number of tourists and pilgrims. Notably, a significant phase of densification occurred **post-2001**, in response to increased connectivity, tourism investments, and relaxed building controls.

Expansion has followed a **linear pattern** along major roads and pilgrimage routes connecting Mathura, Vrindavan, Govardhan, and Barsana. These routes have become the spine of urban sprawl, reflecting a mix of **planned and unplanned development**. The growing demand for accommodation, services, and transport facilities has led to the conversion of agricultural and open lands into built-up zones, often without adequate environmental safeguards.

While urban growth has brought economic benefits, it also poses risks such as **encroachment on heritage areas**, **loss of green cover**, and **increased pressure on infrastructure**. This trend underscores the urgent need for **sustainable land-use planning**, particularly in ecologically and spiritually sensitive areas like Vrindavan.

Area of two classes in percentage from classified image

	1973	1980	1989	1998	2001	2010	2018
Built-up %	7.12	7.73	9.1	11.78	14.62	15.35	23.9
Non-builtup %	92.87	92.27	90.9	88.22	85.38	84.65	76.11

Accuracy assessment of classified image

Sample points taken: 100

Sampling method: Stratified sampling

Area of two classes in percentage from classified image

	1973	1980	1989	1998	2001	2010	2018
Overall Accuracy %	93	94	92	88	90	87	88
Overall Kappa statistics ($K^{\wedge}$)	0	0	0.18	0.20	0.41	0.45	0.56

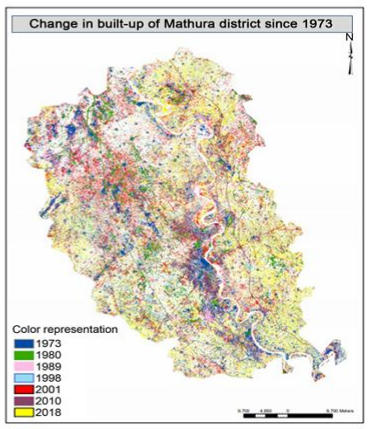


Fig 15 Growth Pattern

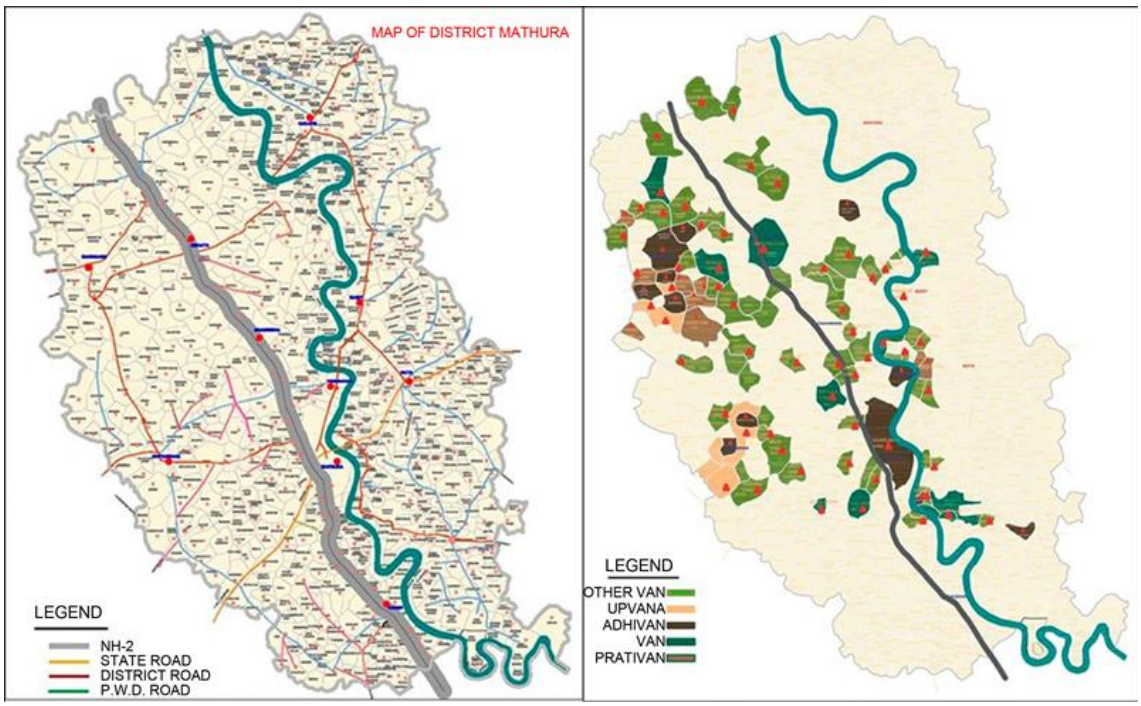


Fig 16 Growth Pattern

Connectivity and Green Cover in Vrindavan: Spatial Insights from the Map

The map clearly highlights Vrindavan's strategic connectivity through **National Highway 2 (NH-2)** and a network of **state and district roads**. These transport corridors play a pivotal role in facilitating **pilgrimage-related traffic**, particularly between major religious centers such as Mathura, Govardhan, and Barsana. Over time, this enhanced connectivity has significantly influenced the **linear pattern of urban expansion**, with built-up developments growing prominently along these roads. The availability of direct road access has encouraged the proliferation of guest houses, commercial establishments, and residential colonies, often at the cost of agricultural and open lands.

While the district as a whole includes several **forest and ecological zones**, Vrindavan's immediate urban core lacks substantial green coverage. The map shows only a few **Upvan (sacred groves)** and **Prativan (protected forest patches)** in and around the city. These areas hold both **ecological and spiritual significance**, rooted in the cultural landscape of Braj, where forests are associated with Lord Krishna's pastimes. However, rapid urbanization and encroachment have led to the shrinking or fragmentation of these green zones.

To ensure sustainable urban growth, there is a pressing need to **conserve and integrate these Upvan and Prativan zones** into a broader network of **green corridors**. Such corridors can improve **urban livability**, **air quality**, and **climate resilience**, while also reinforcing Vrindavan's spiritual identity. Restoring and connecting green spaces will also support **biodiversity** and provide shaded pedestrian paths that enhance the overall pilgrimage experience.

7. Tourism

Vrindavan, located in the Mathura district of Uttar Pradesh, is one of the most sacred cities in India and a major center of pilgrimage tourism. Revered as the childhood home of Lord Krishna, Vrindavan holds immense spiritual and cultural significance for millions of devotees and tourists, especially followers of the Vaishnavite tradition.

Every year, **millions of pilgrims** visit Vrindavan to explore the places associated with Krishna's divine pastimes (leelas). The town is dotted with **ancient temples**, **sacred ghats**, **kunds (water tanks)**, and **forest areas** that are mentioned in religious scriptures like the *Bhagavata Purana*. Key religious festivals, especially **Holi**, **Janmashtami**, and **Radhashtami**, draw large crowds, transforming the city into a vibrant hub of devotional celebration.

Some of the **major attractions** include:

- **Banke Bihari Temple**
- **Prem Mandir**
- **ISKCON Temple (Krishna Balaram Mandir)**
- **Radha Raman Temple**
- **Kesi Ghat**
- **Seva Kunj and Nidhivan**, believed to be the mystical sites of Radha-Krishna's divine plays

Vrindavan is also a part of the **Braj Bhoomi** circuit, which includes Mathura, Barsana, Govardhan, and Gokul—places deeply associated with Krishna's life. Devotees often take part in the **Braj Parikrama**, a pilgrimage circuit covering these sites.

In recent decades, Vrindavan has seen an increase in international tourists, especially spiritual seekers from countries like Russia, the USA, and Brazil. The town hosts several **ashrams and yoga centers**, and the presence of ISKCON has significantly contributed to the global visibility of Vrindavan.

However, the influx of visitors also poses challenges like **traffic congestion**, **pollution**, and **infrastructure strain**, especially during peak pilgrimage seasons. This calls for sustainable tourism strategies that balance religious sentiments with modern urban planning.

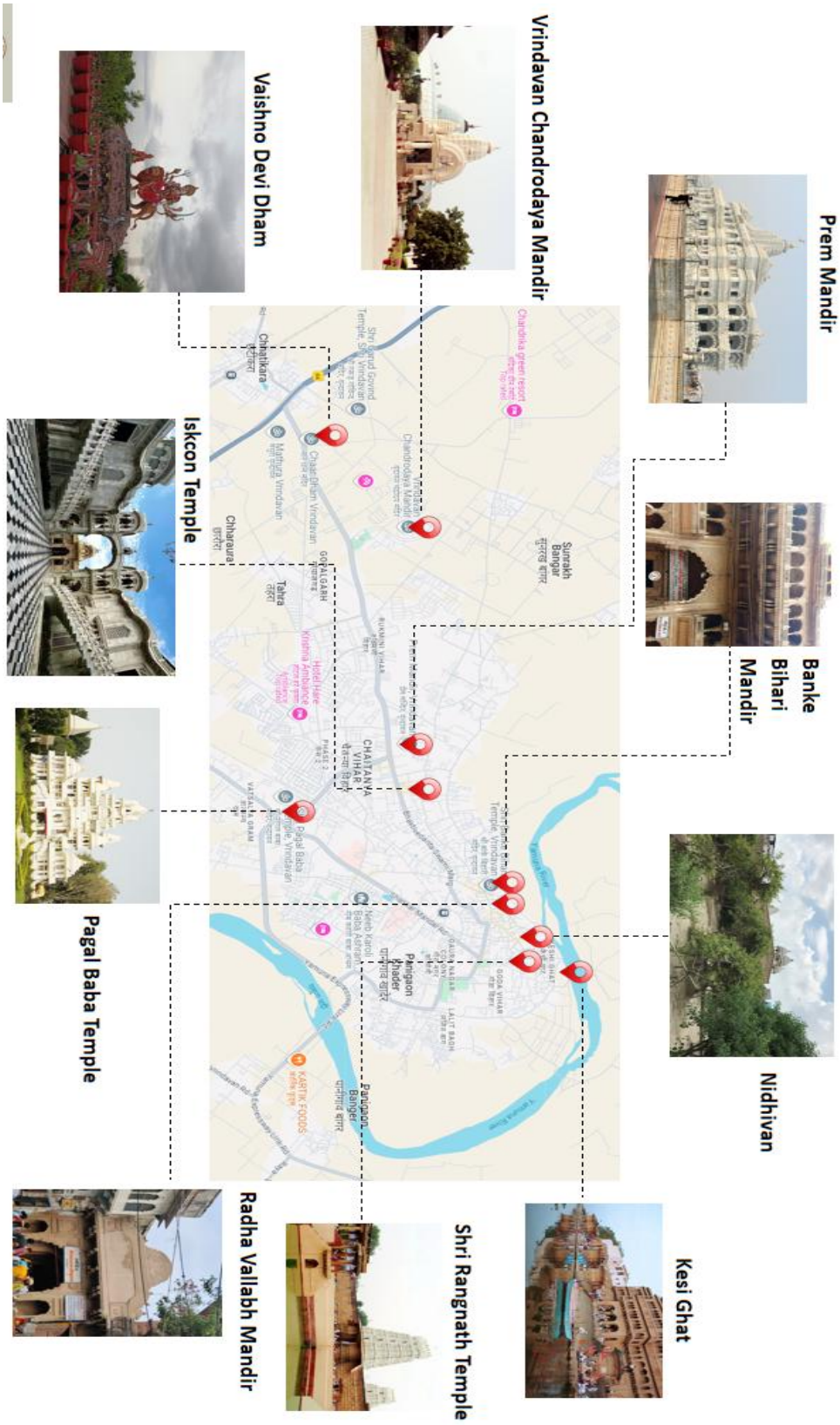


Fig17 Tourist place in Vrindavan

1. Banke Bihari Temple: Banke Bihari Temple is one of the most revered and visited temples in Vrindavan, dedicated to Lord Krishna in his form as *Banke Bihari*, the child-like divine flutist. Established by Swami Haridas, the guru of Tansen, the temple's deity is believed to have manifested from a celestial vision. Unlike other temples, darshan (viewing of the deity) is offered in intervals by drawing a curtain every few seconds, based on the belief that prolonged gaze may cause the deity to follow the devotee. The temple does not have an early morning aarti, as it is believed Krishna sleeps late. During festivals like Janmashtami, Holi, and Radhashtami, the temple becomes a hub of spiritual celebration, attracting thousands of devotees daily. Its narrow lanes, lively chants, flower offerings, and devotional energy make it a deeply spiritual and cultural landmark in Vrindavan's sacred geography.

2. Prem Mandir: Prem Mandir, meaning "Temple of Divine Love," is a magnificent white marble temple located in Vrindavan. Built by Jagadguru Shri Kripalu Ji Maharaj, it is dedicated to Radha-Krishna and Sita-Ram. Inaugurated in 2012, the temple is known for its stunning architecture, intricate marble carvings, and beautifully maintained gardens. The temple complex features scenes from Lord Krishna's life in the form of lifelike sculptures and tableaux. It becomes especially vibrant during evening hours when a grand musical fountain show, coupled with light displays, enchants visitors. Prem Mandir serves not only as a religious destination but also as a cultural and artistic marvel, blending devotion with visual beauty. Managed by Jagadguru Kripalu Parishat, the temple promotes devotional values and spiritual education. The serene ambiance, cleanliness, and spiritual atmosphere make it a must-visit for pilgrims and tourists alike, offering both inner peace and a grand visual experience.

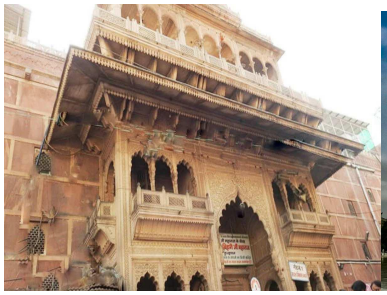
3. ISKCON Temple (Krishna Balaram Mandir): The ISKCON Temple, also known as the Krishna Balaram Mandir, is a globally significant pilgrimage site in Vrindavan, established in 1975 by A.C. Bhaktivedanta Swami Prabhupada, the founder of ISKCON. It is dedicated to Lord Krishna and his elder brother Balaram, with additional shrines for Radha-Shyamasundar and Gaura-Nitai. The temple is a hub for international devotees practicing Gaudiya Vaishnavism, and it promotes bhakti yoga, kirtan (devotional singing), scriptural studies, and vegetarianism. The white marble architecture and serene atmosphere reflect purity and devotion. Regular aartis, Bhagavad Gita classes, and festivals like Janmashtami are conducted with great enthusiasm. The temple complex includes the Samadhi Mandir of Prabhupada, Govinda's restaurant, a guesthouse, and a Gaushala. It plays a vital role in spiritual tourism in Vrindavan, drawing pilgrims from across the world. The ISKCON temple has not only preserved Krishna devotion but has also spread it globally through music, meditation, and teachings.

4 Radha Raman Temple: Radha Raman Temple is one of the most historically and spiritually significant temples in Vrindavan. Established in 1542 by Gopala Bhatta Goswami,

one of the six Goswamis of Vrindavan, it is famous for housing a self-manifested (*swayambhu*) deity of Lord Krishna as Radha Raman. Unlike other temples, this shrine does not have a separate idol of Radha; instead, a crown placed beside Krishna symbolizes her presence. The temple is renowned for its strict adherence to traditional Vaishnava rituals and standards. The architecture is simple yet elegant, with intricate carvings and peaceful surroundings. The deity is small but exquisitely detailed and is adorned with jewels and silks. Radha Raman Temple is a center for serious devotees and scholars who follow the Gaudiya Vaishnavism tradition. Its daily worship, festive celebrations, and continuous chanting preserve the deep spiritual heritage of Vrindavan, making it a cherished pilgrimage destination for seekers of divine love.

5. Kesi Ghat: Kesi Ghat, located on the banks of the sacred Yamuna River in Vrindavan, is one of the most spiritually charged locations in the city. According to legend, it is the site where Lord Krishna killed the demon Kesi, who was sent by King Kansa. After slaying the demon, Krishna is believed to have bathed here, sanctifying the waters. The ghat is lined with historic steps, beautiful old temples, and ghats where devotees bathe to cleanse themselves spiritually. The evening Yamuna Aarti held at Kesi Ghat is a deeply moving experience, with priests performing rituals, lighting lamps, and chanting mantras as the sun sets over the river. The ghat also plays a vital role in many religious festivals and processions. Despite environmental challenges affecting the Yamuna's flow, Kesi Ghat remains a significant symbol of Vrindavan's divine history, attracting pilgrims, photographers, and spiritual seekers from around the world.

6. Seva Kunj and Nidhivan: Seva Kunj and Nidhivan are sacred groves located in the heart of Vrindavan, deeply associated with the divine pastimes (leelas) of Radha and Krishna. According to tradition, this is the site where Radha-Krishna, along with the gopis, performed the *Rasa Leela*. Seva Kunj is believed to be where Krishna performed personal seva (service) for Radha by decorating her with flowers and ornaments. Nidhivan is considered highly mystical—local belief holds that the divine couple still visit the site every night. For this reason, the area is closed to the public after dusk, and no one is allowed to stay overnight. The unique Tulsi trees here are small, twisted, and grow in pairs, said to represent the gopis. Despite its simple appearance, the area holds intense spiritual energy. The sacredness, mystery, and faith surrounding Seva Kunj and Nidhivan make them essential places of pilgrimage and meditation in Vrindavan.



6.1 Tourism Overview

Tourist Age Group

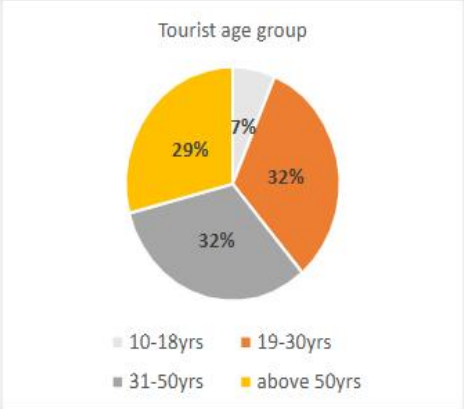


Fig.18 Graph show the distribution of tourist on the basis of age group

The pie chart illustrates the distribution of tourists visiting Vrindavan across different age groups. The data reveals that the largest segments of tourists fall within the **19–30 years** and **31–50 years** categories, each accounting for **32%** of the total tourist population. This indicates a strong presence of both young adults and middle-aged visitors, possibly reflecting a mix of spiritual seekers, working professionals, and family pilgrims.

The **above 50 years** age group constitutes **29%**, which is also significant. This highlights Vrindavan's continued importance for older devotees and retirees, many of whom visit for religious fulfillment, spiritual peace, or to spend extended periods in the holy city.

The **youngest age group**, **10–18 years**, represents only **7%** of tourists. This lower percentage could be due to fewer independent travelers in this group and suggests that youth visits are typically accompanied by families or occur during specific religious festivals or school trips.

Overall, the chart indicates that Vrindavan attracts a **broad demographic**, with a dominance of adults and senior citizens. This age distribution is crucial for planning age-sensitive infrastructure, such as **accessible walkways, resting areas, healthcare facilities**, and **digital guides**, tailored to the needs of both elderly pilgrims and tech-savvy younger visitors.

Gender

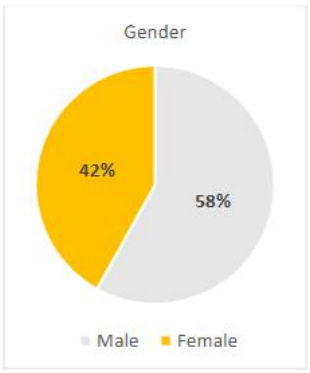


Fig.19 Tourist Distribution on the basis of Gender

The pie chart illustrates the **gender distribution** of tourists visiting Vrindavan. According to the data, **58% of the tourists are male**, while **42% are female**. This suggests a slightly male-dominated visitor pattern, although the gap is not overly wide.

The higher percentage of male tourists may reflect traditional family travel norms in India, where men are more likely to travel independently or lead pilgrimage groups. In some cases, older male devotees may also choose to stay in Vrindavan for longer durations for religious reasons, contributing to the skewed ratio.

On the other hand, the presence of **42% female tourists** is still substantial, highlighting the strong appeal of Vrindavan as a spiritual destination for women. Many women visit with families, in spiritual groups, or as part of organized tours by temples and religious organizations. The increasing visibility of female spiritual seekers and participation in cultural and devotional activities also adds to this figure.

This gender distribution is important for urban and tourism planners. There is a need to ensure **gender-sensitive infrastructure**, such as **safe public spaces, well-lit paths, secure accommodation, clean restrooms, and emergency support services**, especially for solo or elderly female travelers. A balanced and inclusive approach can help improve the pilgrimage experience for all genders in Vrindavan.

Tourist Travelling

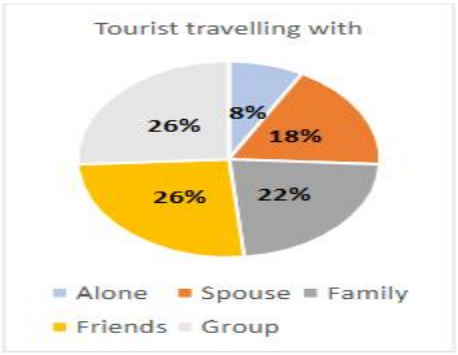


Fig. 20 Graph shows the tourist type on the basis of, with whom they are travelling

The pie chart presents the **modes of companionship** among tourists visiting Vrindavan. It reveals that **26%** of tourists travel with **friends**, while another **26%** are part of a **group tour**. This indicates that Vrindavan is a popular destination for both informal social circles and organized religious or community-based group trips, often coordinated by temples or spiritual organizations.

22% of tourists travel with their **families**, reflecting the city's deep religious and cultural roots, which make it a traditional family pilgrimage site. Family trips typically include multiple generations, particularly during major festivals or school holidays.

Meanwhile, **18%** of visitors travel with their **spouse**, which may point to Vrindavan being part of couple pilgrimage circuits or spiritual getaways. This is followed by **8%** of tourists who travel **alone**—a figure that likely includes spiritual seekers, elderly devotees, and international visitors on personal retreats.

This distribution highlights the need for diverse infrastructure in Vrindavan: **group-friendly accommodations, family rest areas, safety for solo travelers**, and **youth-friendly amenities**. Facilities must cater to a range of needs, from group lodging and guided tours to private, serene spaces for individual spiritual experiences. Recognizing these varied travel patterns is crucial for improving the tourism experience and managing footfall effectively.

Means of Travel

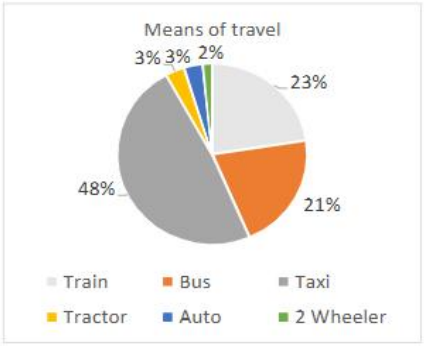


Fig.21 Graph Shows the means of travel used by tourist

The pie chart represents the **means of travel** used by tourists visiting Vrindavan. The most preferred mode of transport is **taxi**, accounting for **48%** of the total, indicating that personalized, door-to-door transport is favored by nearly half the visitors. This preference is likely driven by the convenience, flexibility, and accessibility that taxis provide, especially for families, elderly visitors, or pilgrims carrying luggage.

Buses are the second most popular choice, used by **21%** of tourists. Buses are typically used by large groups, including those organized by religious institutions, tour operators, or community groups, due to their cost-effectiveness and capacity.

Trains, accounting for **23%**, remain an important long-distance travel mode, especially for domestic tourists arriving from other cities or states. While train stations are not located directly in Vrindavan, nearby Mathura Junction serves as a major railhead.

Other forms of travel are less common. **Autos (3%)**, **tractors (3%)**, and **two-wheelers (2%)** are likely used for local commutes or short-distance travel, especially by local or rural visitors. The presence of **tractors** also suggests travel by nearby rural residents during festivals or religious gatherings.

These insights highlight the need to improve **last-mile connectivity**, **public transit options**, and **traffic management** in Vrindavan to support safe and efficient tourist mobility.

Duration of Stay

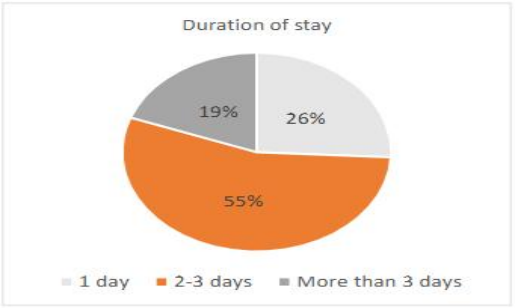


Fig.22 Graph shows the Number of days for which a tourist stays in Mathura Vrindavan

The pie chart illustrates the **duration of stay** of tourists visiting Vrindavan. The data shows that a majority of visitors, **55%**, stay for **2–3 days**, indicating that most tourists plan a short but immersive visit, often over a weekend or during religious events. This duration allows sufficient time to visit major temples, attend spiritual activities, and explore the town without requiring an extended stay.

26% of tourists stay for just **1 day**, reflecting either day-trippers from nearby cities like Mathura or Agra, or those on tight travel schedules who aim to visit only key religious sites. This short duration points to Vrindavan's accessibility and its popularity as a convenient pilgrimage stop.

Only **19%** of visitors stay for **more than 3 days**, which likely includes elderly devotees, spiritual seekers, or tourists interested in deep religious engagement and participation in ashram or seva activities. Some may also extend their stay to explore the broader Braj region.

Understanding these stay patterns is essential for urban and tourism planning. A large proportion of short-term visitors calls for **efficient transport, quick-access amenities, and crowd management**, while long-term visitors need **affordable accommodations, clean facilities, and spiritual retreat options** to enhance their experience in Vrindavan.

Purpose of Visit

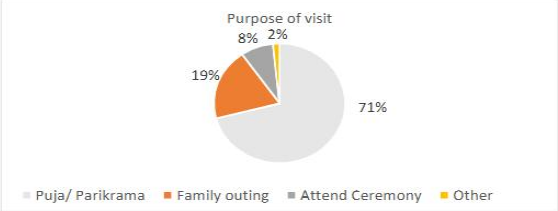


Fig.23 Graph Shows the purpose of visit

The pie chart illustrates the **purpose of visit** for people coming to a specific location, most likely a religious or cultural site. The data shows that the **majority of visitors (71%) come for Puja or Parikrama**, indicating that spiritual and religious activities are the primary reason for travel to this site. This highlights the area's significance as a religious destination and its central role in spiritual tourism.

The second largest group, comprising **19%**, visit the place for a **family outing**. This reflects the site's appeal beyond religious purposes, possibly due to its cultural ambiance, open spaces, or tourist-friendly environment.

8% of the visitors attend ceremonies, such as weddings or religious rituals, suggesting the place is also a venue for organized events, reinforcing its cultural and social importance.

A small portion, **only 2%**, falls under the **'Other'** category. These may include research visits, photography, casual tourism, or local errands.

Overall, the chart underlines the dominance of religious motivations in visitor behavior, followed by leisure and ceremonial purposes. This insight is valuable for planning infrastructure, services, and security—especially during religious festivals or peak seasons—to cater to the needs of pilgrims and tourists effectively.

Prefered day to Travel

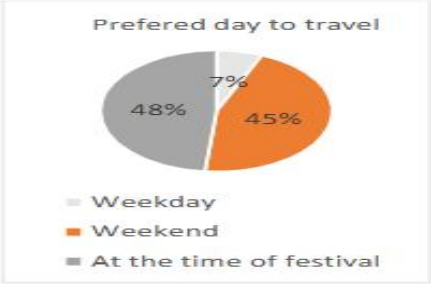


Fig.24 Graph Shows the preferred time to visit Mathura Vrindavan

The pie chart presents data on the **preferred day to travel** for visitors to a particular destination. It reveals that the most favored time for travel is **during festivals**, with **48%** of respondents selecting this option. This indicates that the location attracts a significant number of people during religious or cultural events, likely due to its spiritual or celebratory importance during those times. The influx of visitors during festivals emphasizes the need for better crowd management, security, and services during peak periods.

Close behind, **45% of visitors prefer traveling on weekends**, which suggests that the site is also a popular weekend getaway. This preference could be due to people having more free time and flexibility on weekends, making it ideal for family visits or spiritual retreats.

Only **7% of the respondents travel on weekdays**, indicating relatively low footfall during regular working days. This may be due to work and school commitments or the perception that the site is more vibrant during weekends or festivals.

In summary, the chart shows a clear preference for visiting during **festivals and weekends**, which must be taken into account for infrastructure planning, transportation, sanitation, and crowd control to ensure a smooth visitor experience during these high-demand periods.

Facilities Searched by tourist before Visiting

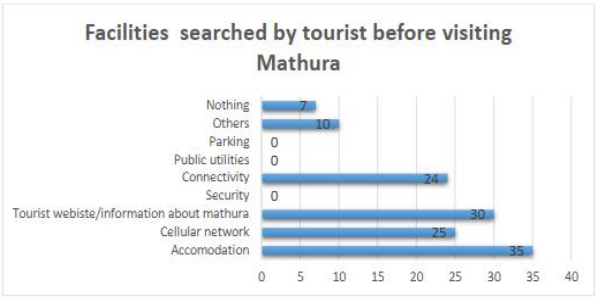


Fig.25 Bar Graph Shows the facilities enquired by tourist before the visit

The bar graph presents data on the **facilities tourists search for before visiting Mathura**. It reveals that the most commonly searched facility is **accommodation**, with **35 tourists** prioritizing it. This highlights the importance of adequate and accessible lodging options for visitors, particularly in a religious destination like Mathura that experiences high tourist inflow.

Following closely, **30 tourists searched for tourist websites or general information about Mathura**. This suggests a strong need for digital presence and reliable online sources that provide details on travel routes, attractions, events, and dos and don'ts, indicating that most tourists prefer to be well-informed before their visit.

Cellular network (25) and **connectivity (24)** were also major concerns, emphasizing the need for good mobile coverage and internet access. These facilities are especially important for navigation, communication, and digital transactions during travel.

Interestingly, **no tourists searched for parking or security**, which might reflect either a lack of awareness or an assumption that these are readily available. However, this also indicates a potential area of improvement in tourist awareness and infrastructure communication.

Only a small group (**7 tourists**) did not search for any facilities, while **10** searched for other unspecified needs. This chart underlines the importance of digital readiness, lodging, and network connectivity in enhancing the tourist experience in Mathura.

Facilities that tourist seek for when in Mathura

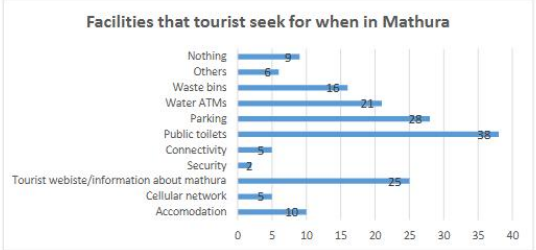


Fig.26 Bar Graph Shows the facilities enquired by tourist, when in Mathura Vrindvan

The bar graph illustrates the **facilities that tourists seek while they are in Mathura**, highlighting their immediate needs during the visit. The most sought-after facility is **public toilets**, with **38 tourists** expressing the need for it. This underscores the urgent requirement for clean and accessible sanitation infrastructure in the city to ensure a comfortable experience for visitors.

Tourist information (25) and **parking (25)** are also high on the list, showing that tourists often look for navigation help, local insights, and convenient places to park once they arrive. This reflects the importance of on-ground guidance systems, signages, and parking management, especially in crowded areas.

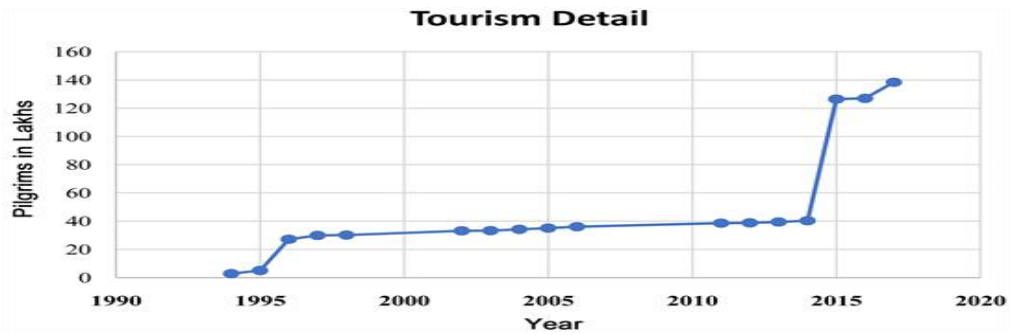
Water ATMs (16) and **waste bins (6)** indicate tourists' basic utility needs like clean drinking water and waste disposal options. Their relatively lower numbers compared to toilets still point toward the need for improving these facilities.

Connectivity (3) and **security (2)** are surprisingly low priorities, possibly because tourists expect these to be inherently available or may not feel immediately threatened. **Accommodation (10)** needs drop once tourists are in the city, showing that lodging is usually pre-arranged.

Overall, the chart highlights that tourists prioritize basic hygiene, transportation, and accessible information once they are physically present in Mathura, and these areas should be the focus of urban and tourism planning.

6.2 Tourism Growth

S. No,	Year	Indian	Foreign	Total
1	2011	3,841,200	18,500	3,859,700
2	2012	3,865,000	18,600	3,883,600
3	2013	3,925,000	18,800	3,943,800
4	2014	4,015,000	19,050	4,034,050
5	2015	12,600,000	47,890	12,647,890
6	2016	12,650,000	48,000	12,698,000
7	2017	13,788,500	50,880	13,839,380



The data table and graph together provide valuable insights into **tourism trends in Mathura** over time. The table highlights a significant **increase in the number of Indian and foreign tourists between 2011 and 2017**. From 2011 to 2014, the total number of visitors gradually increased from around **3.86 million to 4.03 million**. However, a dramatic surge occurred in 2015, with **total visitors jumping to over 12.6 million**, and continuing to rise to **13.8 million by 2017**. This sharp rise suggests either improved infrastructure, increased promotion of religious tourism, or administrative changes in data reporting or destination development.

The accompanying line graph further emphasizes this trend. From 1990 to 2014, the number of pilgrims remained relatively steady with slight growth, averaging around **30–40 lakh (3–4 million)** annually. A clear turning point is visible post-2014, where the graph shows a steep upward spike, with pilgrims exceeding **130 lakh (13 million)** by 2017.

This sudden rise indicates a transformation in Mathura's tourism dynamics—likely influenced by **government initiatives**, **religious events**, improved **connectivity**, or **branding of Mathura-Vrindavan** as a spiritual tourism hub. This trend reflects the growing importance of Mathura as a religious destination, demanding improved urban management, infrastructure, and services to support this tourist influx.

	Tourist footfall calculation for year 2019-20								
		x	y	z	a	b	(x*a*104)/y	(x*b*30)/z	(231*x*a/4)/y
	Name of temples surveyed	Number of hours for which the temple remains open	Number of hours for which tourist number is calculated on weekend day	Number of hours for which tourist number is calculated on festival weekend day	Tourist footfall on weekend day	Tourist footfall on weekend day	Total number of tourist throughout the year on weekends(104 days)	Total number of tourist for 30 days of festival in an year	Total Number of tourist on normal days
1	Shri Krishna Janam Bhoomi	8	1	0.3	873	1,123	726,336	898,400	403,326
2	Drawkadhesh	7	1	0.3	1,034	968	752,752	677,600	417,995
3	Bankey Bihari	8	0.4	0.4	904	1,200	1,880,320	720,000	1,044,120
4	ISCKON temple	11	1	0.2	747	1,267	854,568	2,090,550	474,532
5	Prem mandir	8	1	0.2	638	636	530,816	763,200	294,756
						Total	4,744,792	5,149,750	2,634,728
	There are more than 3000 temple in Mathura- Vrindavan. Assuming 50 tourist throughout weekend day and 100 on festival day.							3000*50*104	3000*100*30
								15,600,000	9,000,000
	Considering 10 tourist for these 3000 temples for rest of the days							3000*231*10	6,930,000
	Total number of tourist per year								44,059,270
	Total number of tourist per year after considering the need to travel.								22,029,635

The table presents a detailed analysis of **tourist footfall at key temples in Mathura-Vrindavan for the year 2019–20**, focusing on visitor patterns across weekends, festivals, and regular days. It calculates data for five major temples: **Shri Krishna Janmabhoomi, Dwarkadhesh, Bankey Bihari, ISKCON temple, and Prem Mandir**.

The methodology considers:

- **Weekend visits** across **104 days**,
- **Festival visits** across **30 days**, and
- **Regular visits** over **231 days**.

Each temple's open hours, footfall per day type (weekend/festival/normal), and total annual visitors are used to compute the final figures.

- Key Findings:

Bankey Bihari temple records the highest total footfall, particularly during festivals, reaching **1,200 tourists/day** and **over 1.88 million annually** on weekends.

The **ISKCON temple** also sees substantial festival turnout with **2.09 million visitors** during festivals.

Combined, the five temples attract over **4.74 million tourists on weekends**, **5.15 million during festivals**, and **2.63 million on regular days**, totaling over **12.5 million visitors annually**.

- Extrapolated Footfall:

Assuming there are **3,000+ temples** in the region and estimating **50 tourists per temple on weekends and 100 during festivals**, the broader temple network could attract:

- **15.6 million tourists on weekends**,
- **9 million on festivals**,
- **6.93 million on normal days**,
  leading to a grand total of **approximately 44 million tourists per year**.

After considering **actual travel feasibility and patterns**, the adjusted **total annual footfall** is estimated at around **22 million tourists**.

These numbers emphasize the **immense religious and tourism potential of Mathura-Vrindavan**, highlighting the urgent need for better **infrastructure, crowd management, sanitation, and public services** to handle this massive influx effectively throughout the year.

S. NO.	YEAR	INDIAN	FOREIGN	TOTAL
1	2011	3,841,200	18,500	3,859,700
2	2012	3,865,000	18,600	3,883,600
3	2013	3,925,000	18,800	3,943,800
4	2014	4,015,000	19,050	4,034,050

5	2015	12,600,000	47,890	12,647,890
6	2016	12,650,000	48,000	12,698,000
7	2017	13,788,500	50,880	13,839,380
8	2018	14,200,000	52,000	14,252,000
9	2019	14,800,000	54,000	14,854,000
10	2020	10,000,000	35,000	10,035,000
11	2021	11,500,000	40,000	11,540,000
12	2022	13,000,000	45,000	13,045,000
13	2023	14,000,000	50,000	14,050,000
14	2024	15,000,000	55,000	15,055,000

Table. Tourist Footfall for Mathura Vrindavan (MVTD 2013)

Tourist Footfall in Mathura-Vrindavan During Festivals (2019–20)

The data reveals that **festival days** draw the **highest number of tourists** to temples in Mathura-Vrindavan. Across the five surveyed temples — **Shri Krishna Janmabhoomi, Dwarkadhesh, Bankey Bihari, ISKCON, and Prem Mandir** — the combined footfall during **30 festival days** totals approximately **5.15 lakh (515,000) visitors**.

Among these:

- **ISKCON Temple** has the highest festival-day footfall: **2,090,550 tourists**, owing to its large-scale celebrations and global popularity.
- **Bankey Bihari Temple**, known for its vibrant festival rituals like **Janmashtami and Holi**, sees **720,000 tourists** during festivals.
- Other temples like **Dwarkadhesh**, **Shri Krishna Janmabhoomi**, and **Prem Mandir** also see hundreds of thousands of visitors in this period.

When extended across **all 3,000+ temples** in the Mathura-Vrindavan region, and assuming an average of **100 tourists per temple per festival day**, the **total estimated footfall during festivals alone reaches 9 million (90 lakh)**. This shows a **massive spike in pilgrimage activity** compared to regular days.

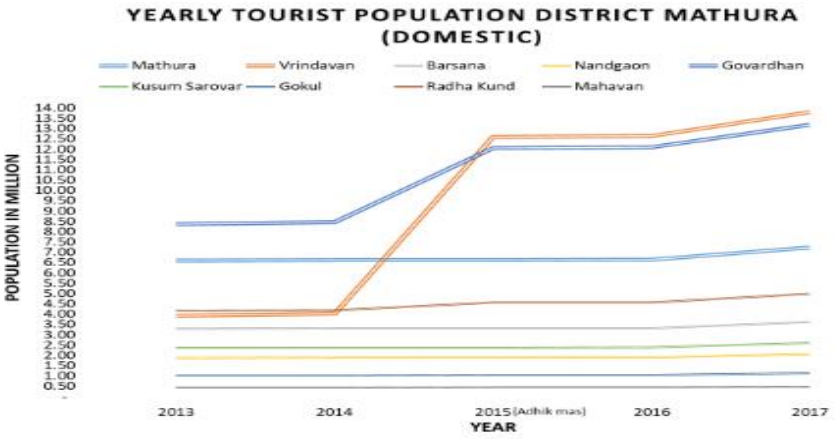


Fig.27 Yearly Tourist Population District Mathura (Domestic)

The graph shows the **yearly domestic tourist population** for various towns in the **Mathura district** from **2013 to 2017**. A sharp increase is evident in **2015**, particularly in **Mathura, Vrindavan, Barsana, and Govardhan**, likely due to the **Adhik Maas (leap month)**, a highly auspicious period in the Hindu calendar that draws massive pilgrimages.

Among all destinations:

Vrindavan and **Mathura** consistently record the **highest tourist inflow**, reaching nearly **14 million** by 2017.

Govardhan and **Barsana** also witness significant increases post-2014.

Smaller destinations like **Kusum Sarovar**, **Mahavan**, and **Gokul** show steady but modest growth, staying under **4 million** visitors annually.

This data highlights the importance of **religious tourism** across the region, with major growth after 2014. It calls for focused development of infrastructure, connectivity, and visitor facilities in both high-traffic and less-visited pilgrimage towns to support balanced tourism across the district.

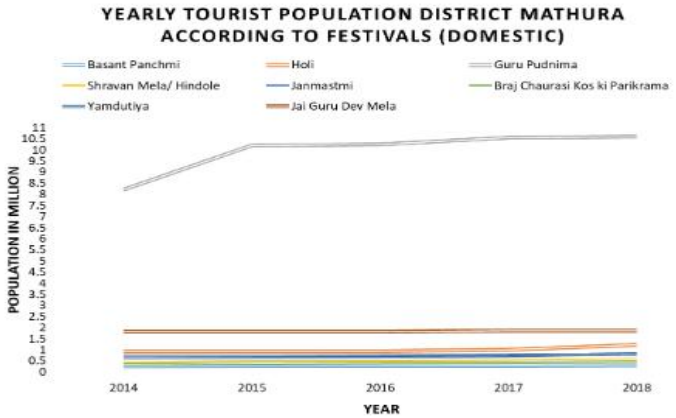


Fig.28 Yearly Tourist Population District Mathura according to Festivals (Domestic)

The graph illustrates the **yearly domestic tourist population in Mathura** during various **festivals from 2014 to 2018**. It highlights that **Jai Guru Dev Mela** consistently attracts the **highest number of visitors**, peaking above **10 million** annually and showing a gradual increase each year.

Other prominent festivals include **Janmashtami**, **Holi**, and **Braj Chaurasi Kos Ki Parikrama**, each drawing over **1.5 million tourists annually**. Notably, **Janmashtami**, linked closely with Lord Krishna's birthplace in Mathura, remains a key religious magnet.

Festivals like **Guru Purnima**, **Yamdutya**, and **Shravan Mela** also show a steady but smaller tourist turnout ranging between **0.5 to 1.2 million** visitors per year.

The overall trend indicates a **stable or slightly rising** influx of domestic tourists during these events. This consistent festival-based tourism showcases Mathura's importance as a **spiritual and cultural hub**, emphasizing the need for enhanced planning, crowd control, and resource management during these peak periods.

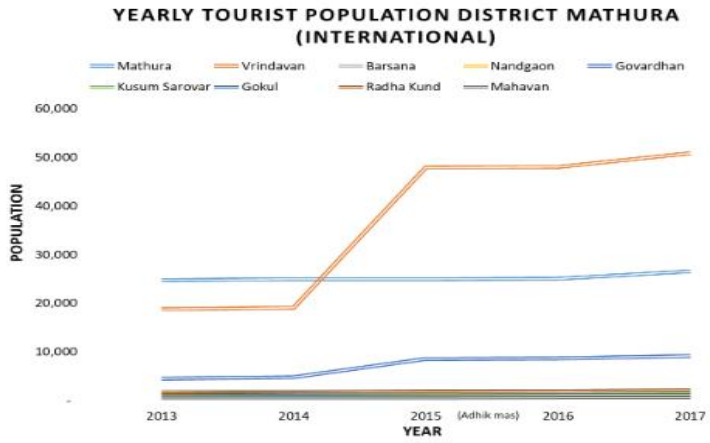


Fig.29 Yearly Tourist Population District Mathura (International)

The graph presents the **international tourist population** visiting various towns in **Mathura district** from **2013 to 2017**. A notable spike occurs in **2015 (Adhik Maas)**, particularly in **Vrindavan**, which saw a jump from around **20,000 to nearly 50,000 visitors**, maintaining steady growth through 2017.

Mathura also shows a gradual rise, reaching close to **25,000 tourists** by 2017. Other towns like **Barsana**, **Govardhan**, **Radha Kund**, and **Nandgaon** remain under **10,000 visitors**, but show consistent, modest increases.

The sharp rise in Vrindavan's international tourists reflects its global recognition as a spiritual center associated with Lord Krishna. The **Adhik Maas year** significantly boosted pilgrimage tourism, reinforcing the area's religious appeal worldwide.

This data indicates that while domestic tourism dominates overall numbers, **international interest is growing**, particularly in **heritage and spiritual sites** like Vrindavan. It calls for improved infrastructure, international-standard amenities, and multilingual guidance services to support this expanding global footfall.

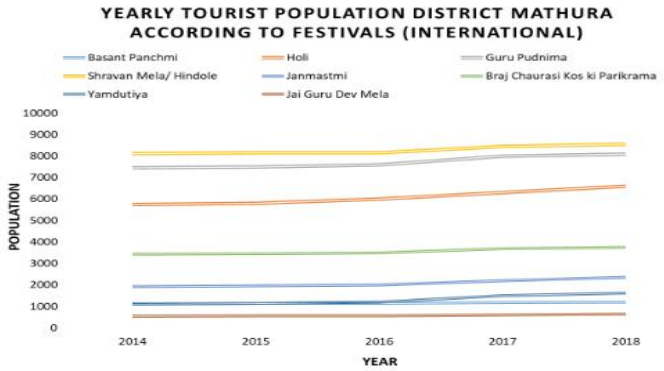


Fig.30 Yearly Tourist Population District Mathura according to Festivals (International)

The graph shows the international tourist population visiting Mathura district from 2014 to 2018 during various major festivals. Among these, **Janmashtmi** consistently attracts the highest number of international tourists, with a steady rise from around 7,800 in 2014 to approximately 8,700 in 2018. **Holi** follows closely, also witnessing a noticeable increase, indicating its growing global appeal. Festivals like **Guru Purnima**, **Braj Chaurasi Kos ki Parikrama**, and **Jai Guru Dev Mela** maintain moderate but relatively stable international tourist numbers throughout the years.

On the other hand, events such as **Basant Panchmi**, **Yamduitiya**, and **Shravan Mela/Hindole** show lower tourist footfall, though they exhibit a slight upward trend over time. This overall growth trend highlights a rising international interest in Mathura's religious and cultural festivities. The data underscores the significance of festivals in drawing foreign pilgrims and the need to strengthen infrastructure to support this growing demand.

6.3 IMPACTS

1. Economic Impact

Tourism is a major economic driver in Vrindavan. The influx of pilgrims and tourists fuels local businesses, including hotels, guest houses, restaurants, shops selling religious items, flower vendors, transport services, and local artisans. It generates both direct and indirect employment, improving the livelihoods of many residents. Religious festivals like Holi, Janmashtami, and Radhashtami witness a massive tourist surge, significantly boosting seasonal income. However, economic benefits are often unevenly distributed, and many small vendors and traditional communities do not receive consistent support or infrastructure to thrive.

2. Social and Cultural Impact

Tourism in Vrindavan encourages cultural exchange and helps preserve religious traditions, music, and rituals associated with Krishna bhakti. However, the heavy influx of outsiders can lead to cultural shifts. Local traditions may be commercialized to cater to tourist preferences, sometimes leading to the loss of authenticity. The spiritual essence of Vrindavan is at risk as

sacred spaces become crowded, noisy, and overly commercialized. In some cases, local residents feel marginalized or disconnected from the religious practices they once deeply engaged in, as their daily lives are disrupted by the growing tourist presence.

3. Environmental Impact

The environmental toll of tourism in Vrindavan is significant. Unregulated visitor numbers, especially during festivals, lead to excessive waste generation, pollution of the Yamuna River, and degradation of ghats and heritage sites. The use of plastic, improper sewage disposal, and dumping of offerings in the river threaten the fragile ecosystem. Deforestation and loss of green cover to accommodate new buildings, parking areas, and commercial zones are further degrading the town's natural landscape. The environmental impacts undermine both the sacred atmosphere and the long-term sustainability of the town.

4. Infrastructure and Urban Pressure

Vrindavan's narrow lanes and limited infrastructure are unable to handle the ever-increasing tourist volume. Traffic congestion, overcrowded streets, lack of parking, and inadequate sanitation facilities are common issues. Unplanned urbanization, driven by tourism demands, has led to haphazard construction that threatens heritage structures and open spaces. The town's infrastructure, originally designed for a small pilgrimage community, is under constant strain, affecting the quality of life for residents and the experience of visitors.

7.ANALYSIS

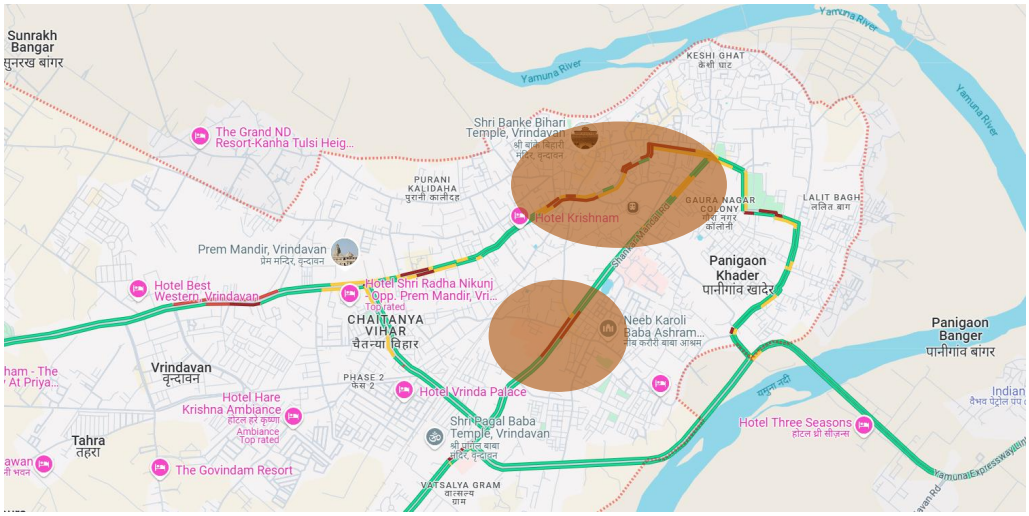
7.1 Mobility and Congestion Pattern

Vrindavan faces severe congestion due to a combination of narrow historical lanes, unregulated traffic, high tourist footfall, and insufficient public transport. Major congestion hotspots include **Banke Bihari Temple area**, **Prem Mandir Road**, **Kesi Ghat**, and **Chhatikara Road**. During peak hours and festival seasons, roads become inaccessible to four-wheelers, and pedestrians struggle to navigate.

Mobility is largely dependent on **e-rickshaws**, **autos**, **tempos**, and **private vehicles**, with limited fixed-route public transport. Lack of parking zones and informal street vending further block road space. Core temple zones are not pedestrianized, and encroachments leave little room for sidewalks.

To address this, pedestrian-only zones, peripheral parking hubs with shuttle service, e-bus corridors, and traffic signal improvements are needed.

Zone/Location	Peak Hours	Type of Traffic	Congestion Level	Key Issues
Banke Bihari Temple	9 AM – 1 PM, 4–7 PM	Pedestrians, e-rickshaws, private cars	Very High	Narrow lanes, no footpaths, street vendors
Prem Mandir Road	5 PM – 9 PM	Tourist buses, cars	High	Lack of bus parking, heavy weekend footfall
ISKCON Temple Area	7 AM – 12 PM	Devotee traffic, tempos	Moderate	No organized drop-off zones
Chhatikara Entry Point	10 AM – 8 PM	Private vehicles, taxis	High	Chaotic entry, no peripheral parking
Kesi Ghat & Nidhivan	4 PM – 7 PM	Pilgrims, pedestrians	Moderate-High	Riverfront encroachments, no traffic control



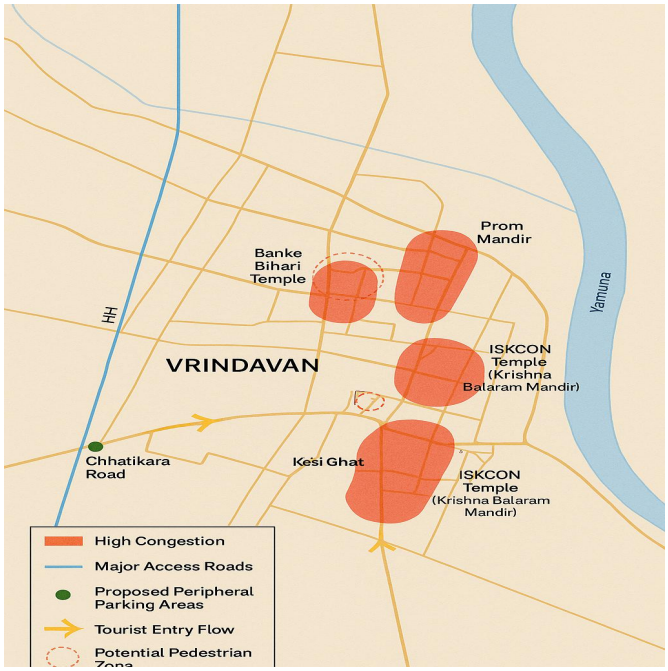


Fig 31 Congestion map

7.2 Street Level Analysis

The streets of Vrindavan reflect a dynamic yet chaotic interplay of religious devotion, informal commerce, and unregulated vehicular movement. Street-level mobility patterns in this pilgrimage town are significantly influenced by the high pedestrian volume, especially during religious festivals and weekends, coupled with the narrow historical street layout that cannot support modern vehicular loads. The old city core, particularly around **Banke Bihari Temple**, is composed of highly congested lanes, often measuring less than 4 meters in width. These lanes were historically pedestrian-dominated but are now shared with e-rickshaws and informal vendors, creating dangerous conflicts between different users.

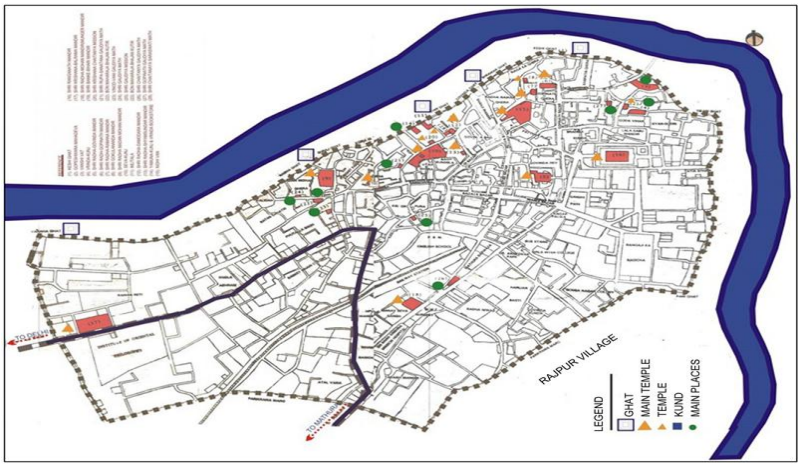


Fig 32 Street Map

- Red Blocks (Temples): “These mark major temples, the core of Vrindavan’s religious tourism. Most of them are concentrated near the Yamuna river.”
- Squares (Ghats): “Ghats are crucial pilgrimage nodes used for rituals and are major congregation points, often heavily crowded.”
- Triangles (Kunds): “Traditional water bodies (kunds) are culturally significant and are potential points for eco-restoration.”
- Green Dots (Main Places): “Denote civic and public nodes that could be utilized for facilities like rest zones, information centers, or mobility hubs.”
- Thick Purple Lines: “These outline the Parikrama path or key tourist movement corridors. Any intervention in mobility or infrastructure should align with these routes.”

Street Width and Hierarchy

Street Name	Average Width	Function	Issues
Parikrama Marg	6–8 m	Religious pedestrian	Vehicular intrusion, encroachments
Banke Bihari Lane	3–4 m	Temple access	Severe congestion, illegal parking
Prem Mandir Road	10–12 m	Tourist corridor	Traffic overflow in peak hours
Chhatikara Road	12–15 m	City gateway	Mixed traffic, informal parking

Parikrama Marg, which is both a spiritual route for pilgrims and a vehicular road. This dual usage causes severe mobility issues. On festival days, the route gets blocked entirely, as thousands of barefoot pilgrims walk the 21-km circuit, while honking vehicles jostle for space. The lack of a well-defined pedestrian path, safety railings, or shaded rest zones adds to the discomfort. Similar challenges are observed in the lanes around **Radha Raman Temple** and **Seva Kunj**, where narrow alleys turn into choke points due to illegal parking and street vendors occupying more than half of the available space.

In contrast, **Prem Mandir Road** and **Chhatikara Road**, located towards the city’s outskirts, are relatively wide, with carriageways of 10–15 meters. These streets were planned more recently and accommodate motor vehicles, buses, and rickshaws. However, due to poor regulation and absent pedestrian infrastructure, even these roads are unsafe for foot traffic. Informal parking, broken sidewalks, and lack of crossings result in frequent pedestrian-vehicle conflicts. Pilgrims walking from bus drop points to temples often have to walk on the road itself, increasing accident risks.

Pedestrian infrastructure is largely missing across Vrindavan. Footpaths, where available, are broken, encroached upon, or used for vending. Pedestrian crossings are almost non-existent, and signage is insufficient to guide tourist flows. The lack of lighting, seating spaces, or public amenities further discourages walking, especially among the elderly and disabled.

Additionally, the increasing number of e-rickshaws—although environmentally friendly—often crowd the narrow lanes due to absence of designated bays or traffic discipline, leading

to localized traffic jams.

To address these issues, street-level interventions must prioritize **complete street designs**, ensuring safe mobility for all users. This includes the creation of **pedestrian-only zones** in core temple areas, installation of **bollards** to prevent vehicular intrusion, clear **zoning of hawking spaces**, and **widening of footpaths** where feasible. Implementing **wayfinding signage** and **shaded resting points** can enhance walkability for pilgrims. Strict enforcement of no-parking zones, designated e-rickshaw stops, and realignment of utilities underground are also necessary for long-term improvement.

Key Streets and Characteristics

Street Name	Avg. Width	Primary Use	Key Issues
Banke Bihari Lane	3–4 m	Temple access, pedestrian	Severe congestion, illegal parking
Parikrama Marg	6–8 m	Religious procession	Shared use by pedestrians & vehicles
Prem Mandir Road	10–12 m	Tourist corridor	Mixed traffic, pedestrian safety
Chhatikara Road	12–15 m	Entry to city, highway	Unregulated traffic, poor crossings

Physical Street Conditions

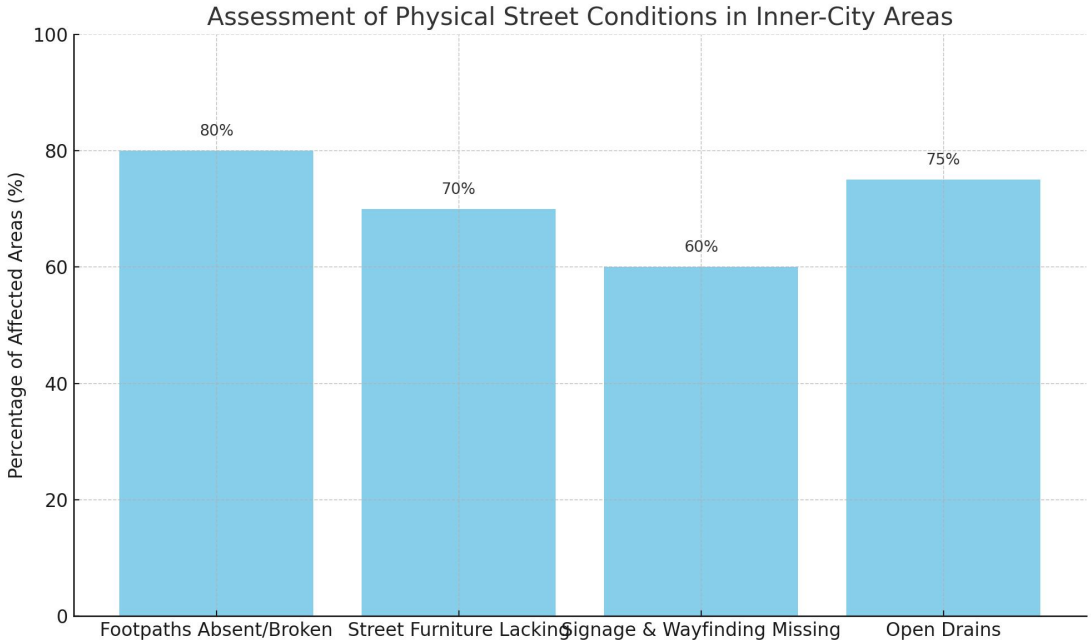
The physical street conditions in the inner-city areas present significant challenges for both residents and visitors, particularly in terms of safety, comfort, and accessibility. One of the most critical issues is the state of **footpaths**. In nearly 80% of the inner-city roads, footpaths are either completely absent or broken. This forces pedestrians to walk directly on the road, increasing the risk of accidents and disrupting traffic flow. The lack of dedicated walking space is especially problematic near temples and high-footfall areas, where pedestrian movement is frequent and dense.

Additionally, **street furniture**—which plays a crucial role in providing comfort and usability in public spaces—is largely missing. Most streets lack **shaded seating**, public **waste bins**, and **adequate lighting**, making them less welcoming and user-friendly, especially for the elderly, women, and children. The absence of shaded resting spots is a major drawback in hot climates, discouraging longer walks or religious parikrama routes.

Signage and wayfinding systems are also minimal or entirely absent, particularly in areas near temples or cultural landmarks. This lack of guidance can confuse tourists and first-time visitors, diminishing the overall spiritual and cultural experience and hampering footfall in religious tourism.

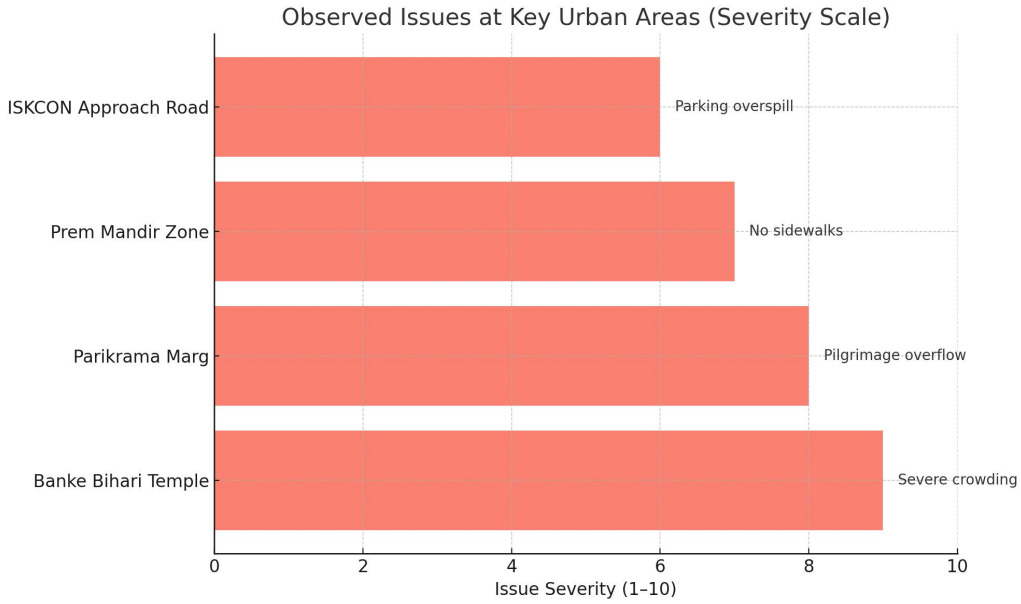
Another major concern is the state of **drainage infrastructure**. Many inner lanes have **open drains**, which are not only unhygienic but also hazardous. These drains often overflow during the monsoon, leading to waterlogging, foul smells, and health risks due to stagnant water. Narrow lanes with poor drainage become completely inaccessible in such conditions.

Overall, the combination of broken or missing infrastructure, poor amenities, and inadequate drainage reflects a need for comprehensive street upgrades to ensure safety, comfort, and dignity for all users—especially in culturally significant urban areas.



Traffic and Congestion Patterns

Area	Peak Hours	Dominant Users	Observed Issues
Banke Bihari Temple	10 AM – 2 PM, 5–9 PM	Pedestrians, vendors	Severe crowding, blocked lanes
Parikrama Marg	4 AM – 10 AM (festivals)	Pilgrims, e-rickshaws	Shared lanes, pilgrimage overflow
Prem Mandir Zone	Evenings, weekends	Tourists, cars	E-rickshaw chaos, no sidewalks
ISKCON Approach Road	Mornings, evenings	Mixed users	Traffic jams due to parking overspill



7.3 Pedestrian Infrastructure Gaps

The current state of pedestrian infrastructure in many urban and pilgrimage areas reveals significant gaps that hinder safe and comfortable movement for people on foot. These deficiencies not only affect daily commuters but also pose serious challenges during peak hours and festive occasions, especially in high-footfall zones such as temple complexes and cultural hubs.

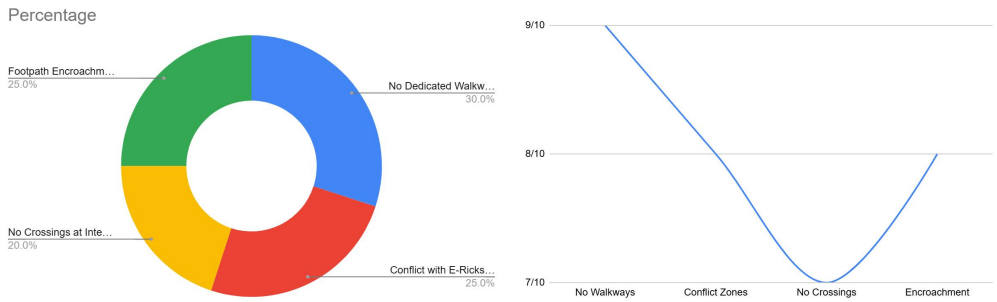
One of the primary issues is the **absence of dedicated walkways** in areas that see heavy pedestrian traffic. Despite the constant flow of devotees, tourists, and locals in places like temple entrances, market streets, and parikrama paths, there is often no clearly demarcated space for pedestrians. As a result, people are forced to walk on the same lanes as motorized vehicles, increasing the chances of accidents and congestion.

Another major concern is the presence of **conflict zones**, where **e-rickshaws and pedestrians share the same narrow lanes**. These shared spaces become hazardous, especially during peak hours when the volume of both users increases. Without proper traffic segregation or lane discipline, such areas turn chaotic, compromising pedestrian safety and slowing down overall movement. In religious and heritage zones, this problem becomes more severe, as crowds swell during special events and there is no scope for real-time management of pedestrian flow.

Additionally, there is a clear **lack of pedestrian crossings** at crucial intersections. Many busy junctions and road crossings do not have zebra crossings, pedestrian signals, or even raised platforms to ensure safe road crossing. This forces pedestrians to navigate moving traffic, putting them at great risk. The absence of safe crossing points particularly endangers the elderly, children, and persons with disabilities, making public spaces inaccessible and unsafe for all.

The issue is further worsened by the **encroachment of footpaths by hawkers** and informal vendors. In many streets, the footpaths—where they exist—are occupied by stalls, pushcarts, or parked vehicles, leaving no usable space for pedestrians. Consequently, people are pushed onto the roads, again competing with vehicular traffic. While street vending is a vital part of the local economy, its unregulated spread has made pedestrian movement difficult and dangerous.

In summary, the lack of walkways, shared spaces with vehicles, absence of crossings, and encroachments collectively result in unsafe and inefficient pedestrian infrastructure. Addressing these gaps through better planning, inclusive design, and regulated usage is crucial to create safe, accessible, and walkable cities—especially in culturally significant and high-traffic zones.



Recommendations

Intervention Type	Suggested Actions
Pedestrianization	Create no-vehicle zones around temples; allow access only to e-rickshaws on permit
Footpath Development	Construct continuous, non-slip, 1.5–2 m wide footpaths in key corridors
Hawker Management	Introduce designated vending zones to clear movement pathways
Signage & Wayfinding	Install bilingual signage, route maps, and direction boards
Rest Points & Shade	Place benches, shaded areas every 300–400m along major pilgrim paths
E-Rickshaw Regulation	Introduce stands and restrict them near key temple entrances
Traffic Control	Use bollards, traffic police, CCTV at chokepoints

7.4 Existing Infrastructure and Challenges

A. Transportation Infrastructure

Infrastructure	Current Status	Challenges
Roads	Narrow internal streets; few well-maintained main roads	Frequent traffic jams; poor pedestrian safety
Parking Facilities	Limited, mostly unorganized parking near temples	Illegal parking worsens congestion
Public Transport	Few buses; reliance on informal e-rickshaws	Lack of organized, clean, frequent service
Pedestrian Infrastructure	Very few designated sidewalks	Pedestrians forced to walk on vehicle roads, unsafe especially for elderly pilgrims
Cycle Infrastructure	Almost non-existent	No encouragement for non-motorized transport

B. Green and Public Spaces

Aspect	Current Status	Challenges
Parks and Gardens	Very few formal parks (mostly temple gardens)	Lack of public resting spaces for pilgrims
Green Corridors	Minimal existing green linkages	Unshaded walking routes; pilgrims exposed to heat
Yamuna Riverfront	Deteriorated condition, pollution, encroachment	Loss of sacred environmental quality

- High levels of air pollution during peak seasons due to idling vehicles.
- Noise pollution from honking and traffic near temples.
- Encroachment on footpaths and public land by shops and informal vendors.
- Lack of signage and information boards, making navigation confusing for first-time visitors.
- Inadequate waste management, especially near major pilgrimage centers.

Problem Statement and Need for Intervention

Traffic Congestion and Environmental Degradation

- Vrindavan, as a prominent pilgrimage destination, witnesses millions of visitors annually.
- However, the city's infrastructure has not evolved proportionately with this increasing tourist influx.
- The unregulated entry of private vehicles, lack of designated parking areas, and inadequate public transport options result in severe traffic congestion, especially around major temples like Banke Bihari, Prem Mandir, and ISKCON.
- Narrow lanes, mixed traffic, and pedestrian movement competing for the same road space create bottlenecks and frequent traffic jams, particularly during festivals and peak seasons.
- This congestion contributes directly to environmental degradation

Impact on Pilgrimage Experience

- The spiritual and cultural essence of Vrindavan is deeply tied to its calm, sacred atmosphere and the ease of connecting with heritage sites.
- However, the crowded streets, noise, poor walkability, and unclean surroundings negatively impact the pilgrimage experience.
- Devotees often find it difficult to move peacefully between temples, participate in rituals at ghats, or access sacred kunds.
- The lack of shaded walkways, clean sanitation facilities, and organized routes disrupts both the physical comfort and spiritual ambiance of the pilgrimage.
- Furthermore, vulnerable groups such as the elderly and physically challenged face immense difficulties navigating congested, uneven pathways.

Gaps in Current Planning and Policy

- Current urban planning in Vrindavan lacks a holistic, integrated approach to managing pilgrimage tourism.
- While there are isolated infrastructure projects and beautification drives, they often lack coordination with environmental and mobility needs.
- There is no clear zoning policy to restrict vehicles in sensitive temple zones, nor is there a robust public transport system tailored to pilgrims.
- Policies on urban development have not fully incorporated green infrastructure principles, such as water-sensitive design, shaded green corridors, or eco-mobility networks.
- Moreover, community and stakeholder involvement in planning is minimal, leading to solutions that are often top-down and unsustainable.

Inferences

The proposed urban interventions mark a significant and strategic shift toward designing safer, more inclusive, and pedestrian-friendly environments, especially in culturally and religiously significant urban areas experiencing high footfall. These measures are tailored to

address not just the physical shortcomings of current infrastructure but also the socio-cultural dynamics and economic activities that shape such urban landscapes. The primary inference that emerges is the deliberate prioritization of **pedestrian movement and comfort**. This is evident in the recommendations to create no-vehicle zones around temple areas and develop continuous, non-slip walkways that are at least 1.5 to 2 meters wide. Such footpaths ensure smooth and safe mobility for all users, including elderly pilgrims, women, children, and the differently abled, while also reducing vehicular congestion in sensitive zones. This not only enhances physical accessibility but also improves the **spiritual and cultural experience** of visiting sacred places by creating a more peaceful, hazard-free environment.

A second major inference is the proposal's thoughtful attempt to **balance urban order with local economic needs**, particularly through the regulation of street vending. Street hawkers are an essential part of temple town ecosystems, offering religious items, food, and services that cater to devotees. However, their unregulated presence often clogs footpaths and public spaces. The recommendation to create designated vending zones is a practical and sensitive approach that safeguards vendors' livelihoods while maintaining clear movement pathways for pedestrians. This shows a recognition of the **informal economy** as a critical urban layer and integrates it within formal planning frameworks, enabling a more harmonious coexistence.

The focus on **user experience** is another clear takeaway. Interventions such as installing bilingual signage, route maps, and direction boards aim to make the city more legible and navigable for both tourists and locals. Providing resting areas with shade at regular intervals along pilgrim paths addresses the physical needs of users walking long distances, especially under intense weather conditions. These features reflect an **inclusive design philosophy** that prioritizes comfort, accessibility, and dignity for all users.

In terms of **mobility management**, the regulation of e-rickshaws stands out as a key concern. While e-rickshaws offer crucial last-mile connectivity, especially in narrow lanes where larger vehicles cannot enter, their unregulated movement can lead to congestion and conflict with pedestrian flows. Introducing specific e-rickshaw stands and restricting their access to temple gates ensures a balanced system where mobility is retained but chaos is reduced. This represents a move toward **controlled and environmentally friendly transport options** that complement pedestrian zones rather than compete with them.

Finally, the integration of **traffic enforcement and surveillance** through tools like bollards, dedicated traffic police, and CCTV reflects the importance of urban governance in ensuring these interventions are effectively implemented and maintained. It shows that successful transformation is not just about infrastructure but also about **behavioral regulation and ongoing monitoring**.

In conclusion, these interventions reflect a **holistic, integrated, and context-sensitive approach** to urban planning. They consider not only the physical structure of cities but also the social, cultural, and economic dynamics that shape everyday life. The overall inference is that to make sacred and historic cities truly inclusive and functional, planning must be

comprehensive—preserving heritage while enhancing safety, mobility, and public space quality for all.

7.5 Future Implications and Issues

Enhanced Pilgrim Experience
Vrindavan, being a major pilgrimage center, will benefit from improved pedestrian pathways and no-vehicle zones around temples. This makes the spiritual experience more peaceful, safe, and accessible for devotees.

Preservation of Heritage and Culture
Limiting vehicle access and reducing pollution helps preserve Vrindavan's historic temples, ghats, and sacred sites, which are vulnerable to environmental degradation.

Promotion of Sustainable Tourism
Pedestrian-friendly infrastructure encourages sustainable tourism by reducing carbon footprint and supporting eco-friendly travel modes like walking and cycling.

Improved Public Health and Safety
Reduced vehicular traffic cuts down on air and noise pollution, contributing to better health for residents and visitors. Safer streets decrease accidents and conflicts.

Community Cohesion
Public spaces designed for walking and gathering strengthen social ties among locals and pilgrims, enhancing the city's cultural vibrancy.

Issues

High Footfall and Crowd Management During festivals and daily peak hours, managing large crowds safely on narrow pathways remains a major challenge. **Encroachment and Informal Economy Conflicts** Street vendors and informal businesses often encroach on footpaths, causing obstruction and tension between pedestrian needs and livelihoods. **Narrow Roads and Limited Space** Vrindavan's traditional urban layout with narrow lanes limits the scope for wide, continuous pedestrian pathways without major interventions.**Traffic Diversion and Congestion Elsewhere** Vehicle restrictions in key zones may cause increased traffic load on surrounding streets, affecting residents and local commerce. **Maintenance and Enforcement Issues** Sustaining the quality and accessibility of pedestrian infrastructure requires continuous upkeep and strict enforcement to prevent encroachments and ensure safety. **Accessibility Gaps for Vulnerable Groups** Current pedestrian designs may not adequately address the needs of elderly, differently-abled, and mobility-impaired visitors, who form a significant portion of Vrindavan's population.

7.PROPOSALS

This chapter includes proposals and recommendations which is given for better and effective management of the study area in context to Heritage zone. Proposals are provided at ward and street level. The context includes proposed planning interventions including guidelines based on the issues which are identified such as for change in land use, change in traditional skyline of city, material change, congestion, to preserve the cultural heritage of the city and other development control regulations. Other general recommendations were also provided.

Location	Proposed Intervention	Purpose	Expected Benefit
Banke Bihari Temple Road	Full pedestrian-only zone	Reduce vehicular congestion near shrine	Safer, spiritual, and walkable environment
Prem Mandir Approach	Timed pedestrian access	Control crowd flow during peak hours	Enhanced visitor management
ISKCON Road	Semi-pedestrian with barriers	Promote walkability near religious campus	Mixed mobility with reduced traffic

Street-Level Pedestrianization Proposals for Key Temple Roads in Vrindavan

To address the intense crowding, vehicular congestion, and deteriorating pilgrim experience in Vrindavan, a set of street-level interventions are proposed around its three major temple zones: **Banke Bihari Temple Road**, **Prem Mandir Approach**, and **ISKCON Road**. Each area demands a specific strategy based on its traffic flow, visitor density, and spatial configuration.

The **Banke Bihari Temple Road** experiences the highest footfall, especially during festivals and weekends. The narrow lanes are often choked with e-rickshaws, pedestrians, and vendors. To improve safety and preserve the sanctity of the space, a **full pedestrian-only zone** is proposed within a 300–500m radius. Bollards or traditional gateways will restrict vehicle entry, while natural stone paving and shaded walkways will encourage spiritual walking. This creates a safer, more immersive temple experience, particularly for elderly pilgrims.

For the **Prem Mandir Approach Road**, a **timed pedestrianization strategy** is recommended. During peak hours (e.g., evening light shows and aarti times), the road will be closed to all motorized traffic. Smart signage and automated gates will manage entry and exit based on crowd density. This strategy balances daily accessibility for local residents and prioritizes pedestrian safety during high visitor flows.

Along the **ISKCON Road**, a **semi-pedestrian approach** is envisioned. Using low-height bollards, wide sidewalks, and shared-use surfaces, the road will allow limited access to e-rickshaws while giving priority to pedestrians. This promotes a balanced street environment around the ISKCON campus, where large foot traffic from ashrams and guest houses needs accommodation without full traffic closure.

Together, these proposals aim to transform Vrindavan's spiritual core into a **safer, walkable, and more spiritually enriching** environment while managing mobility in a context-sensitive and culturally respectful manner.

8.1 Cycle Track & E-Rickshaw Corridor

Corridor	Intervention	Length (Approx.)	Purpose	Benefit
Parikrama Marg	Dedicated cycle track	10 km	Pilgrimage circuit support	Eco-friendly, non-motorized mobility
Chhatikara to ISKCON	Shared e-rickshaw + cycle lane	4.5 km	Connect junction to temple area	Last-mile connectivity
Rangi Mandir to Kesi Ghat	NMT (Non-Motorized Transport) track	2 km	Enhance walkability to ghats	Encourages active travel

Parikrama Marg – Dedicated Cycle Track (10 km)
Parikrama Marg is a spiritual pilgrimage route encircling sacred landmarks in Vrindavan. A **dedicated cycle track** along this 10 km stretch would cater to both pilgrims and locals who prefer traditional, non-polluting modes of travel. Using green-painted lanes, soft dividers, and shaded areas, the design will ensure safety and comfort. This intervention not only supports eco-friendly movement but also encourages slow, immersive pilgrimage experiences that align with Vrindavan's spiritual essence.

Chhatikara to ISKCON – Shared E-Rickshaw + Cycle Lane (4.5 km)
This corridor serves as a **critical entry point** for pilgrims arriving from Mathura and the NH-19 highway. Introducing a **shared lane** for e-rickshaws and bicycles between Chhatikara Junction and ISKCON temple will facilitate **last-mile connectivity** while reducing dependency on private vehicles. Clearly marked lanes and regulated parking nodes will maintain traffic flow and ensure safety. The route will also include signage and resting areas, enhancing accessibility for elderly visitors.

Rangi Mandir to Kesi Ghat – NMT Track (2 km)
This stretch leads to the sacred Kesi Ghat and is heavily used by pedestrians. Establishing a **dedicated NMT track** will enhance **walkability and access to the Yamuna River**, while protecting the ecological and spiritual value of the ghats. It will be lined with benches, shaded areas, and green buffers to make the walk more pleasant.

8.2 Street Furniture and Amenity Proposals for Pilgrim-Friendly Streets in Vrindavan

Component	Location	Design Theme	Purpose	Outcome
Benches	Every 100–150 m near temples/ghats	Traditional stone/wood	Seating for elderly/pilgrims	Visitor comfort
Dustbins (segregated)	Temple areas, food streets	Color-coded, covered	Waste management	Cleaner environment
Wayfinding signboards	Heritage circuits, crossings	Multilingual, heritage-style	Guide pilgrims/tourists	Reduced confusion, cultural info
Street lighting	Narrow lanes and ghats	Solar + LED heritage lamps	Night safety	Energy-efficient and safe streets

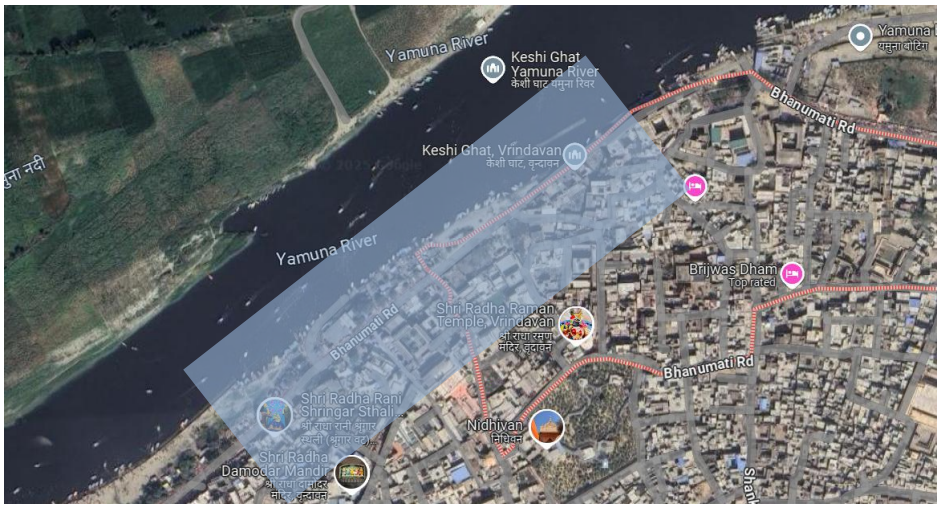


Fig 33 Satellite Map

To enhance the experience of pilgrims and tourists in Vrindavan, the integration of **context-sensitive street furniture** is essential. These elements not only provide comfort and guidance but also contribute to the aesthetic, cultural, and functional value of public spaces.

Benches are proposed every 100–150 meters near high-footfall zones such as temples and ghats. These will be constructed using **traditional materials** like carved stone or wood to blend with Vrindavan's architectural identity. The primary purpose is to offer **resting spots**, especially for elderly devotees, families, and those participating in parikrama. These strategically placed benches enhance overall visitor comfort and allow moments of pause in the spiritual journey.

Segregated dustbins will be installed across temple precincts and food vending areas. Using **color-coded and covered designs**, these bins will promote **solid waste segregation** at the source—biodegradable, non-biodegradable, and recyclable. This supports Swachh Bharat initiatives and ensures that the sacred environment remains clean and hygienic.

Wayfinding signboards are another key intervention. These will be **multilingual (Hindi, English, and possibly Braj dialect)** and styled to match Vrindavan's heritage look, using traditional fonts and motifs. Placed at heritage circuits, street junctions, and near major temples, these signboards help pilgrims **navigate the city with ease**, reducing confusion and encouraging cultural learning.

Finally, **street lighting** in narrow lanes, heritage zones, and along ghats will be upgraded with **solar-powered LED lamps** featuring heritage-style posts. These lights ensure **night-time safety** while being energy-efficient and low-maintenance. They also enhance the visual ambiance of Vrindavan's evening aarti rituals and parikrama paths.

Together, these simple yet impactful amenities will help create a **devotee-centric, culturally immersive, and ecologically responsible urban environment**.

8.3 Last-Mile Connectivity and Shuttle System

Hub Location	Proposed Facility	Connectivity Nodes	Mode	Outcome
Chhatikara Junction	Multi-modal transport hub	ISKCON, Banke Bihari, Yamuna ghats	E-bus, e-rickshaw	Reduced private vehicle use
Bhaktivedanta Circle	Circular e-rickshaw loop station	Prem Mandir, Ashrams, Ghats	Shared NMT modes	Continuous, affordable mobility
Vrindavan Bus Stand	Park-and-Ride system	Inner temple zone (no personal vehicles)	Shuttle buses	Decongests city core

Fig 34 Last-Mile Connectivity

Electric Shuttle/Bus Route (Solid Green Line)

A dedicated **electric bus/shuttle corridor** loops through major streets and temple areas. These battery-powered vehicles offer **low-emission, noise-free mobility** and are ideal for group pilgrim transport. This network connects outer city zones to core heritage areas without contributing to local pollution.

Cycle and Pedestrian Sharing Zones (Green Dotted Lines)

To encourage active travel, the plan proposes a network of **cycle tracks and pedestrian zones**. These areas will be shaded, traffic-calmed, and integrated with shared cycle docks. The goal is to **encourage short-distance travel by foot or cycle**, reducing dependency on autos and e-rickshaws within the sacred zone.

Smart Mobility Hubs (E Icons)

Marked with a blue **"E"**, these hubs act as **intermodal transition points**. Pilgrims arriving via buses, private cars, or rickshaws can switch to electric shuttles or cycles here. Amenities such as digital info kiosks, toilets, benches, and drinking water will support users. They are strategically located at:

- ✓ Outer city junctions
- ✓ Close to temple zones
- ✓ Near major entry roads

E-Rickshaw Integration Points (Red "D/FR" Icon)

This zone functions as a **park-and-ride** terminal where e-rickshaws can pick up and drop off visitors from designated areas. These points also prevent e-rickshaws from crowding sensitive inner lanes. They ensure **structured, regulated last-mile travel** and reduce traffic chaos near temples.

General Recommendation

Vrindavan, a sacred town visited by millions of pilgrims annually, requires a mobility plan that prioritizes pedestrian safety, environmental sustainability, and preservation of its spiritual and cultural heritage. A comprehensive approach to sustainable mobility can enhance the pilgrim experience while ensuring the long-term well-being of the city.

The first and foremost recommendation is the **pedestrianization of key temple zones** such as Banke Bihari, ISKCON, and Radha Raman Mandir. Creating vehicle-free corridors with non-slippery, shaded walkways, resting areas, and accessible amenities will ensure a safer and more serene spiritual journey. These paths must be designed to accommodate elderly pilgrims, people with disabilities, and large crowds, especially during festivals.

To reduce traffic congestion, **dedicated e-rickshaw routes and peripheral parking facilities** should be developed. These eco-friendly shuttles would connect remote parking lots with the temple precincts, ensuring last-mile connectivity while reducing vehicular intrusion into the heritage core. Transit hubs can act as key interchanges for tourists arriving by bus, private vehicles, or trains.

Integrated signage and wayfinding systems—both physical and digital—should be introduced to help visitors navigate the city with ease. A multilingual mobile application could provide maps, shuttle timings, temple schedules, and emergency contact information.

Infrastructure must follow **universal design principles**, ensuring inclusivity for all users. Features like tactile paths, wheelchair ramps, handrails, medical booths, and shaded seating areas are essential for vulnerable groups such as the elderly and differently-abled.

During peak pilgrim seasons and festivals, **smart crowd management** strategies should be implemented. This includes temporary barriers, drone surveillance, real-time monitoring, and clearly demarcated emergency evacuation routes. Reviving and upgrading **traditional Parikrama paths** with better lighting, signage, and encroachment control will also support spiritual practices.

Community involvement is crucial. Awareness campaigns targeting local vendors, temple trusts, and residents can build support for sustainable mobility initiatives. Eco-sensitive street design with green buffers, permeable paving, and tree-lined paths will reinforce Vrindavan's identity as a sacred and environmentally responsible town.

Lastly, a **central mobility monitoring system** should be set up to collect and analyze data on pedestrian flow, traffic patterns, and infrastructure performance—enabling continuous improvement and adaptive planning.

Together, these recommendations aim to create a balanced, inclusive, and sustainable urban mobility framework for Vrindavan that respects its religious significance while improving the everyday experience for residents and visitors alike.

✅ Do's	❌ Don'ts
Prioritize pedestrian zones near temples and ghats	Don’t allow unrestricted vehicle access in temple areas
Design inclusive infrastructure for elderly and differently-abled	Don’t overlook accessibility and universal design principles
Promote eco-friendly transport like e-rickshaws and electric shuttles	Don’t depend on polluting and noisy transport options
Develop peripheral parking lots outside heritage zones	Don’t permit random or illegal parking in sacred or congested areas
Upgrade and protect traditional Parikrama paths	Don’t allow encroachment on footpaths and religious circuits
Install multilingual signage and mobile-friendly navigation aids	Don’t leave visitors confused due to lack of clear information
Engage local communities, temple trusts, and vendors	Don’t exclude stakeholders from planning and implementation
Plan crowd control for festivals using barriers and emergency lanes	Don’t ignore the need for seasonal infrastructure management
Include greenery, rainwater drains, and shaded areas in path design	Don’t use inappropriate or slippery materials on footpaths
Monitor mobility using technology and data systems	Don’t make decisions without real-time data and feedback loops
Maintain infrastructure regularly (cleanliness, lights, paths)	Don’t neglect repairs or maintenance in high-traffic areas
Run awareness campaigns on sustainable practices	Don’t allow unmanaged waste or pollution in sacred zones

CONCULSIONS

The spiritual and cultural identity of Vrindavan is deeply intertwined with its sacred geography, vibrant pilgrimage traditions, and historic urban fabric. However, the ever-growing influx of pilgrims, especially during festivals, has put immense pressure on its narrow streets, fragile heritage structures, and overstretched urban systems. In this context, the implementation of a **Sustainable Mobility and Pedestrian Plan** is not just a necessity, but a transformative step toward protecting Vrindavan's sanctity while enhancing the experience of its millions of visitors.

A well-planned pedestrian infrastructure that includes non-slippery pathways, shaded rest zones, universal access features, and traffic-free temple precincts can significantly improve safety, comfort, and spiritual immersion for pilgrims. Encouraging **eco-friendly transport** such as e-rickshaws, while restricting private vehicles in core heritage areas, will reduce air pollution, noise, and congestion—making Vrindavan's streets more serene and navigable.

Strategic interventions like **peripheral parking facilities**, **multilingual signage**, and **smart crowd management systems** are essential to handle seasonal peaks and enhance wayfinding. At the same time, attention must be given to reviving **traditional religious circuits** like the Parikrama Marg, ensuring their cultural continuity and protecting them from encroachment or neglect.

Sustainable mobility is not merely about transport—it is about inclusivity, equity, and environmental sensitivity. The success of such a plan depends on **community participation**, especially involving temple trusts, local vendors, residents, and tourists themselves. Public awareness campaigns, stakeholder workshops, and participatory planning processes will ensure long-term ownership and sustainability of the initiative.

Importantly, the plan must be backed by **data-driven governance**. A central mobility command system using digital tools and real-time analytics can help monitor flows, assess performance, and dynamically adapt to changing conditions. Regular maintenance of footpaths, lighting, green spaces, and public toilets must be institutionalized rather than treated as one-time actions.

In conclusion, Vrindavan has the opportunity to become a model for **heritage-sensitive, inclusive, and sustainable pilgrimage towns**. A thoughtful mobility plan will not only restore order to its sacred streets but also enhance the spiritual atmosphere, protect cultural assets, and provide dignity and comfort to every visitor—be it a local devotee, an elderly pilgrim, or an international tourist. This shift toward sustainable urbanism ensures that Vrindavan continues to flourish as a timeless destination of faith, peace, and environmental harmony.

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